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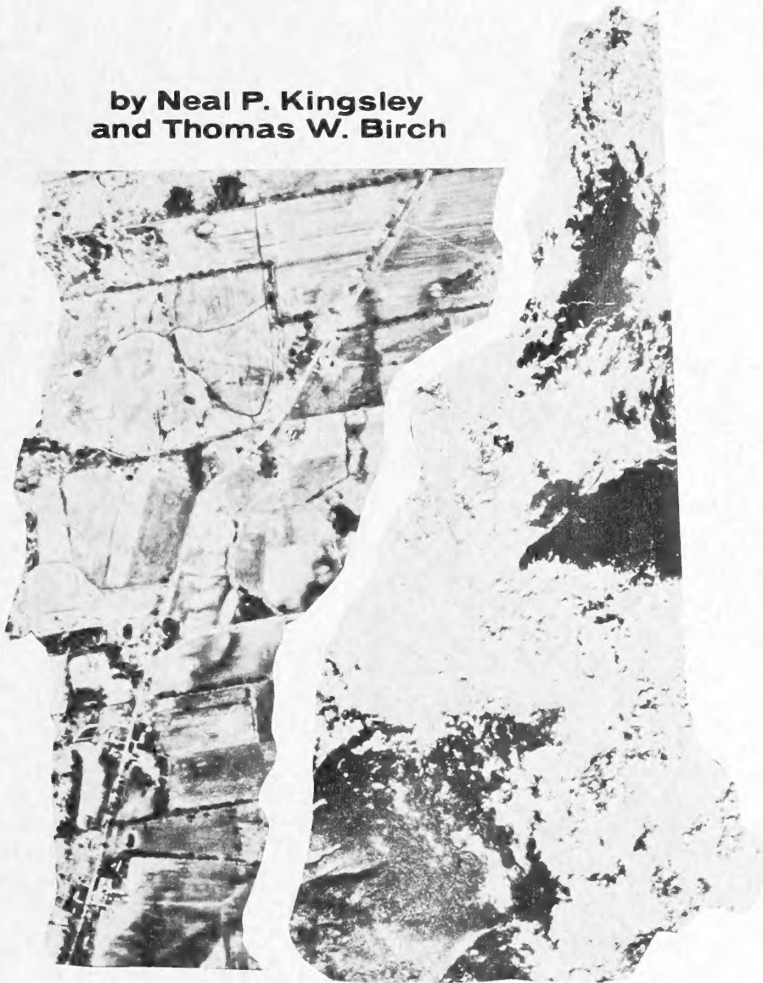
THE FOREST-LAND OWNERS OF NEW HAMPSHIRE AND VERMONT

FOREST AND RANGE
EXPERIMENT STATION

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by Neal P. Kingsley
and Thomas W. Birch



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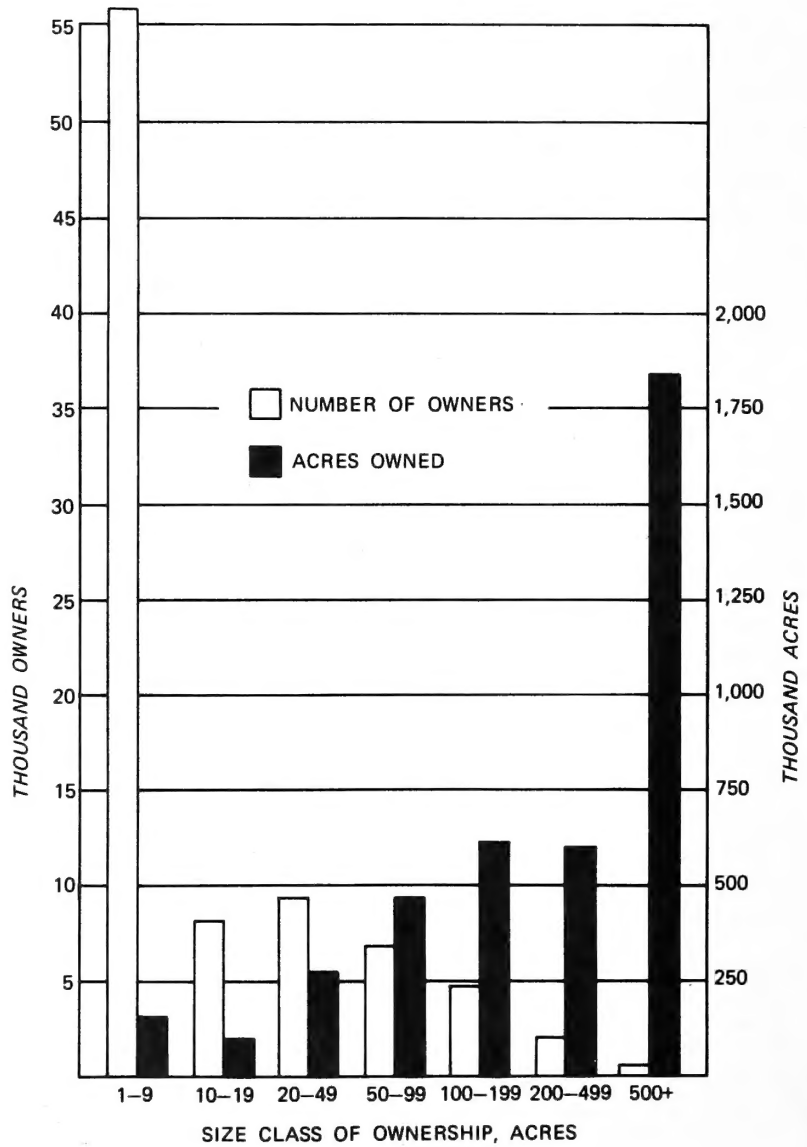
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Figure 1.—Estimated number of forest-land owners in NEW HAMPSHIRE, and total acreage owned, by size class, 1973.



THE FOREST LAND AND ITS OWNERS

THE RECENTLY COMPLETED forest surveys of New Hampshire and Vermont provided estimates of forest area and timber volume by broad owner categories (*Kingsley 1976 and 1977*). However, these reports did not provide estimates of the volume of timber or the acreage of commercial forest land that is currently available for harvesting. Nor did they provide descriptions of typical forest-land owners, their reasons for owning forest land, or their attitudes toward timber harvesting, forest management, and the recreational use of their lands by the public.

This information is needed by public agencies for planning and organizing forestry and related programs geared to forest-land owners. It is also useful to forest industries that wish to locate available supplies of timber, as well as to people who are interested in further research on the motivation and objectives of forest-land owners. An understanding of the forest-land owners is particularly important in understanding the entire forest-resource situation in New Hampshire and Vermont, because the overwhelming portion of commercial forest land in these states is privately owned. In New Hampshire 87 percent of the commercial forest land is in private ownership, and in Vermont 90 percent is in private ownership.

The purpose of this report is to provide this information in a form that facilitates its use in conjunction with the data provided in the resource reports. The data presented here are based on a sample of forest-land owners in the two states. The results of this sample have been statistically expanded to provide an estimate of the total population of owners of privately held forest land and the acreage that they own. For this reason the user of this report should consider it as presenting a broad overview of the

forest ownership situation in New Hampshire and Vermont. Further, the user is strongly advised to read the definitions of terms and the discussion of study design and sampling errors presented in the appendixes of this report.

Historically, forestry and farming have played significant roles in the development of both New Hampshire and Vermont. In recent decades, however, agriculture and timber production have declined in relative economic importance. Yet the rural populations of both states have been increasing. During the 1960s New Hampshire's rural population grew 27.1 percent, and Vermont's grew 25.6 percent (*U.S. Bureau Census 1970*). The reason for this increase in rural—primarily nonfarm—population is that, with increased mobility, many former urban residents have been able to live in a rural environment while continuing to be employed in urban areas. These former urban residents often have different backgrounds and interests than the lifelong rural resident. Because of this, these people are having a profound influence on what is happening to forest land and the ownership of it in both states. Tenure, size, and the objectives of ownership are often greatly affected by the owner's background.

There are an estimated 164,800 owners of privately held commercial forest land in Vermont and New Hampshire. In Vermont 77,300 owners hold nearly 4 million acres. In New Hampshire 87,500 own 4.1 million acres. In Vermont the average private ownership is 51.6 acres; in New Hampshire 46.6 acres.

Ownerships in the two states range in size from 1 acre to more than 325,000 acres. However, both the median and modal size of ownerships fall in the 1- to 9-acre size class. This means that most owners own fewer than 10 acres. Although 54 percent of the owners hold only 3 percent of the commercial forest land, 39

Figure 2.— Estimated number of forest-land owners in VERMONT, and total acreage owned, by size class, 1973.

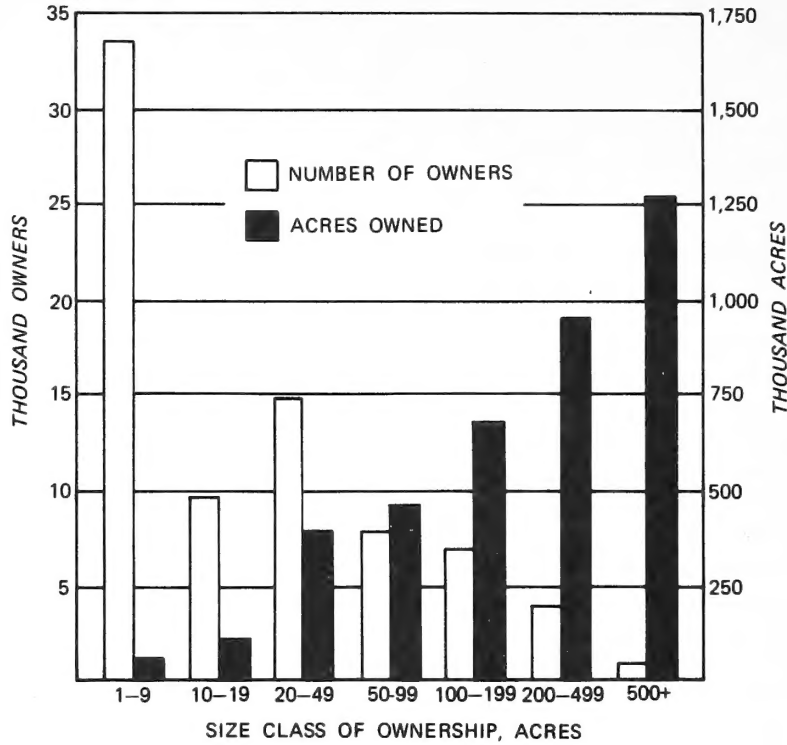
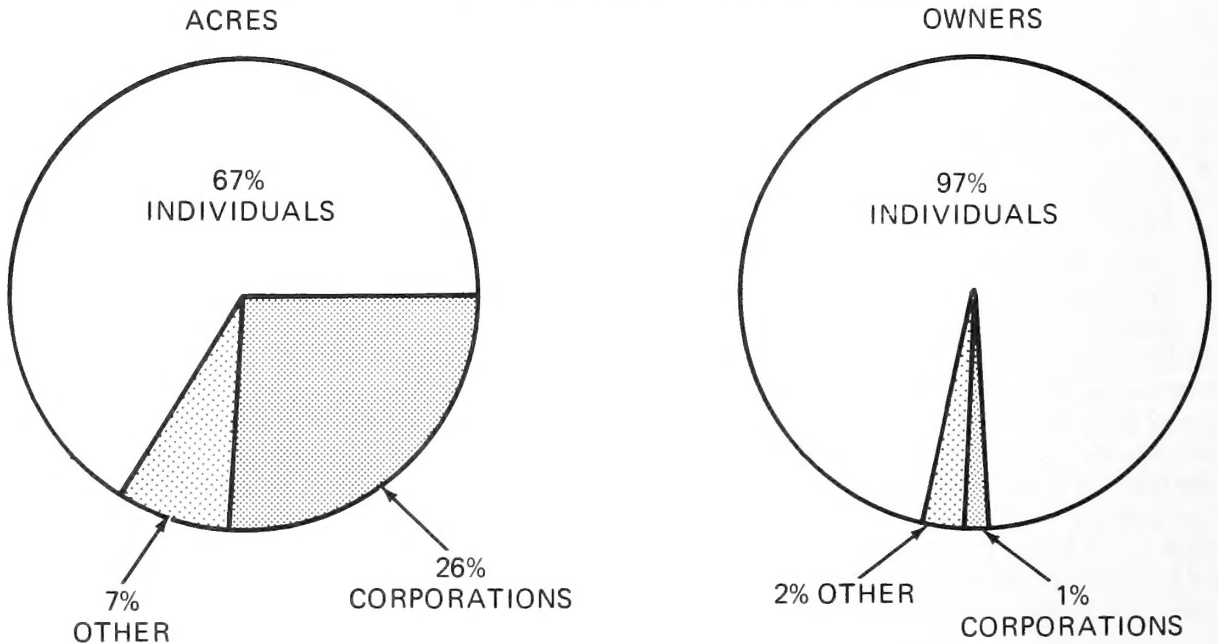


Figure 3.—Percentage of all owners and proportion of total acreage they own, by form of ownership, NEW HAMPSHIRE and VERMONT, 1973.



percent of this land is controlled by the 1 percent of the owners who own 500 acres or more. Figures 1 and 2 show the number of owners and acres of commercial forest land owned, by size class of ownership, in New Hampshire and Vermont.

Individuals account for 97 percent of the owners and 67 percent of the private commercial forest land. Although corporations account for only 1 percent of the owners, they own 26 percent of the commercial forest land. The remaining 2 percent of the owners and 7 percent of the land is accounted for by partnerships, undivided estates, and clubs and associations (fig. 3).

The Individual Forest-Land Owner

The development of many industries in New Hampshire and Vermont probably accounts for the fact that more than 44 thousand individual owners reported their occupations as skilled labor. These 27 percent of all owners account for only 6 percent of the land. Other important owner groups are white-collar workers, professionals, retired persons, and executives. These latter groups account for 42 percent of the owners, and they own 40 percent of the privately owned commercial forest land.

Consistent with the decline in the importance of agriculture in the two states is the fact that only 5 percent of the owners are farmers. However, farmers have the highest average acreage of any occupation group—more than 88 acres per owner. They account for 14 percent of the commercial forest land. It should be pointed out that in this study farmers are defined as those owners whose primary source of income is farming. Not included are owners who are part-time farmers or retired farmers. This is in contrast with the U.S. Bureau of the Census definition as used in the 1969 Census of Agriculture, which includes these two groups (*U.S. Bureau of Census 1969*).

New Hampshire and Vermont forest-land owners are by and large well educated and affluent. Sixty percent of the individual owners have more than a high school education, and 5 percent have either Ph.D or M.D. degrees. These 60 percent hold 63 percent of the 5.4 million acres held by individuals. In this two-state region, 55 percent of the forest-land owners have incomes of \$10,000 per year or more. In fact, one-third have incomes of \$15,000 or more.

Not surprisingly, this 55 percent own 72 percent of the commercial forest land held by individuals.

When we look at ages, length of ownership, place of residence, and early life background of the forest-land owners of New Hampshire and Vermont, we begin to get an idea of what has been happening to forest-land ownership in these states in recent years. Nearly 50 percent of the individuals who own forest land in the two states are 45 years old or older, and these owners hold 75 percent of the commercial forest land—4.1 million acres. Fifty-three percent of all owners have owned their forest land for fewer than 10 years. These owners control only 27 percent of the privately held forest land. At the opposite extreme, 2 percent of the owners have held woodland for more than 50 years, and they control 14 percent of the commercial forest land.

The majority—83 percent—of the owners live either on their land or within 5 miles of it. These owners hold 79 percent of the private commercial forest land. The nonresident or absentee owner is often spoken of as constituting a very important segment of the landowner population. However, the results of our study show that owners whose primary place of residence is more than 50 miles from their land account for only 11 percent of the owners and 12 percent of the land. As for early life background, more than one-third of the individuals who own forest land in New Hampshire and Vermont spent the first 12 years of their lives in a city or a town of more than 15,000 population. These owners hold 35 percent of the commercial forest land held by individuals.

From this description one can sense that many of the present owners in New Hampshire and Vermont own forested land and live where they do by choice rather than by chance. Our data reflect what has often been surmised: that many owners are emigres from urban areas who have sought a better living environment. How they will influence land-use patterns, forest policy, timber production, and forest management in the region is a continually unfolding picture.

Although forest-land owners in Vermont are somewhat older than those in New Hampshire and own slightly more forest land, the profiles of the typical owner in these states are strikingly similar:

Forest-Land Owner Profiles

<i>Category</i>	<i>New Hampshire</i>	<i>Vermont</i>
Age	Under 45	45 to 64
Education	Beyond high school	Beyond high school
Income	\$10,000 to \$15,000	\$10,000 to \$15,000
Early life environment	Rural	Rural
Occupation	Skilled laborer	Skilled laborer
Length of ownership	5 to 9 years	5 to 9 years
Size of tract	1 to 9 acres	10 to 19 acres
Distance from nearest tract	Less than 5 miles	Less than 5 miles
Number of tracts	1	1
Reason for owning	Part of residence	Part of residence

Corporate and Other Owners

Corporations own 22 percent of the privately owned commercial forest land in Vermont and 31 percent in New Hampshire. Yet corporations account for only 1 percent of the owners in both states. This means that the average corporation in the two states holds 1,167 acres of commercial forest land.

Forest-based industries are by far the largest corporate holders of commercial forest land, owning 666,300 acres in Vermont and 946,900 acres in New Hampshire. Forest industries account for less than 0.5 percent of all owners in either state. Real-estate development companies hold an estimated 115,800 acres of commercial forest land in Vermont and 127,300 in New Hampshire. Nonforest industries hold 104,000 acres, and nonindustrial businesses hold 25,500 in the two states. Incorporated farms, which are often important corporate landowners in more agricultural states, hold only 27,300 acres of commercial forest land in the two states—less than 0.5 percent. Other ownerships, such as clubs and associations, churches, youth organizations, and educational institutions hold an estimated 143,900 acres or about 2 percent of the commercial forest land in the two-state region.

OWNER OBJECTIVES

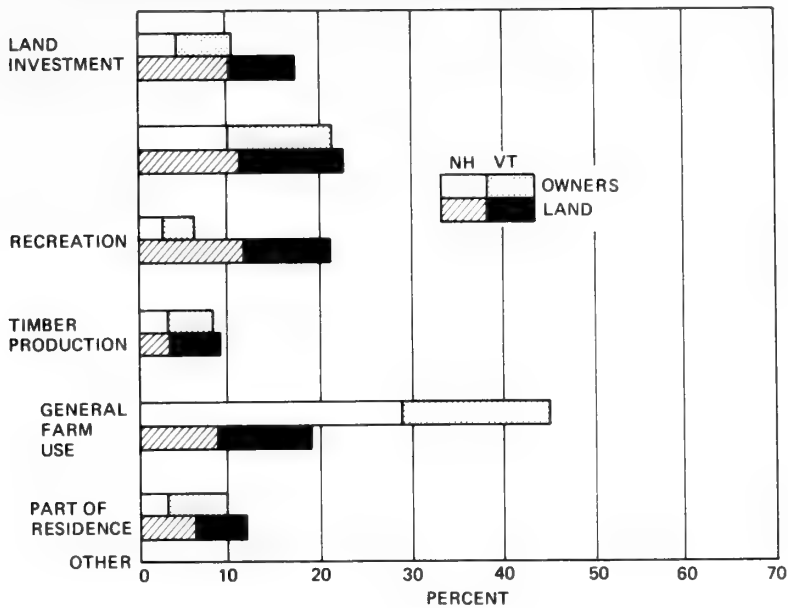
Why People Own Forest Land

Though only 10 percent of the owners said that they own their forest land for investment purposes (fig. 4), 21 percent said that increased value is the major benefit they derived from their forest land during the past 5 years. Further, 26 percent said they expect the increase in land value to be an important benefit in the coming 5-year period. These owners, those to whom increased land value is a reason for owning forest land and those who consider it a past or future benefit, own tracts that slightly exceed the average tract size in the two states—about 49 acres.

Marler and Graves (1974) have suggested that, since the value of land rarely decreases, many owners perceive speculation as an objective that is likely to be fulfilled. Our data lend credence to this suggestion and further indicate that many owners who may not have acquired forest land with speculation in mind have found it to be a major benefit in the past, and even more expect it to be an important benefit in the future.

One frequently hears statements to the effect that individuals seldom acquire or hold land in

Figure 4.—Reasons for owning commercial forest land in NEW HAMPSHIRE and VERMONT, by percentage of owners and acreage, 1973.



New Hampshire or Vermont in anticipation of increasing land values. However, our data do not support this conclusion. In Vermont an estimated 33 percent of all owners indicated that they expected the increase in land value to be the most important benefit they would derive from owning forest land. In New Hampshire 19 percent indicated the same reason.

An estimated 45 percent of the owners of private commercial forest land in New Hampshire and Vermont said they owned their land simply because it was part of their residence. These owners tend to hold smaller-than-average tracts—about 21 acres on average. Many of these owners were among those who indicated that the increase in land value is an important past and future benefit. Many others felt that esthetic enjoyment was the most important past and future benefit. The psychological sense of wellbeing from being surrounded by “green space” and the privacy it provides are important to many owners in this region. Of all owners, 36 percent felt that their esthetic enjoyment of the land was most important in the past 5 years and 50 percent expected it to be the most important in the coming years.

Recreational enjoyment is perhaps the most complex of all ownership objectives because

there are so many forms of recreation that can take place on forested land. To ensure pleasurable recreational experiences for themselves, many owners have purchased forest land. Twenty-one percent of all owners gave recreation as the primary reason they owned forest land. Nineteen percent of the owners felt that recreational enjoyment was the most important benefit in the past 5 years, but only 10 percent felt that recreation would be the most important benefit received in the next 5 years. It is not really possible to say what benefit those owners who indicated recreational enjoyment in the past but not in future expect to be the important benefit in the future. However, in a region like New Hampshire and Vermont it is all but certain that the majority would expect the increase in land value to be most important.

“Timber production” and “farm or domestic use” are closely related ownership objectives. The only major difference between them is that in the first case the timber products are sold and that in the second case the timber products—usually fuelwood, fence posts, and farm timbers—are retained and used by the property owner. Only 6 percent of the owners in the two states listed timber production as a reason for owning forest land. These owners

control 21 percent of the commercial forest land in the two states. It is interesting to note that only 1.3 percent indicated timber production as the most important reason for owning forest land, 3.2 percent list it as the second most important reason, and the remaining 1.5 percent listed it as less than the second most important.

Income from the sale of timber was an important benefit of owning forest land for 3 percent of the owners in New Hampshire and Vermont. These owners hold 15 percent of the woodland. Only 2 percent of the owners expect income from the sale of timber to be an important benefit in the coming 5 years. These owners hold 10 percent of the forest land.

The explanation of why fewer owners perceived a past or future benefit from the sale of timber than indicated timber production as an ownership objective may be twofold. First, forest industry owners, though they own forest land for timber production, often sell none of their timber to others. Therefore these owners cannot logically indicate income from the sale of timber as a land-holding benefit. The second reason may be the time frame. Timber growing is a long-term business, and undoubtedly many owners who own forest land for timber production did not consider income from the sale of timber as a major benefit over the 5-year period, but would over a longer time span.

Eight percent of the owners listed farm and domestic use as their reason for owning forest land, and they own 9 percent of the commercial forest land. Thirteen percent of the owners stated that farm and domestic use was important in the last 5 years. These owners control 9 percent of the forest land. Owners of 9 percent of the commercial forest land said they expect timber production for farm and domestic use to be important in the coming 5 years.

Predicting the Owner's Future Harvesting Intentions

Which owners are most likely to harvest timber and which are least likely to? To answer this question we have analyzed several combinations of responses to various questions in the questionnaire. To accomplish this analysis we used the multivariate analysis technique called AID III (Automatic Interaction Detector) (*Sonquist and others 1971*). This technique was used to analyze the harvesting intentions of

forest-land owners in three future time frames: the next 5 years, the next 10 years, and some indefinite future date.

By comparing a respondent's answers to selected questions with his answer to the question of whether or not he intends to harvest in each of the three time frames, the AID computer program selects the question that is most significantly related to whether or not the owner intends to harvest, and then it groups the responses. It continues this process until no further significant sorting can be made. Thus the ending groups will contain either a very high proportion of owners who intend to harvest or a very low proportion.

An earlier version of the AID technique was used to explain the intent of 394 Pennsylvania forest-land owners to sell or not to sell timber in the next 5-year period (*Larsen and Gansner 1973*). They found that those owners who had harvested in the past had a high inclination to harvest in the future. While we found that a similar relationship existed also in Vermont and New Hampshire, our analysis was concerned primarily with identifying those owners most likely to harvest timber, based on the interests or characteristics of the owner or of the land he owns.

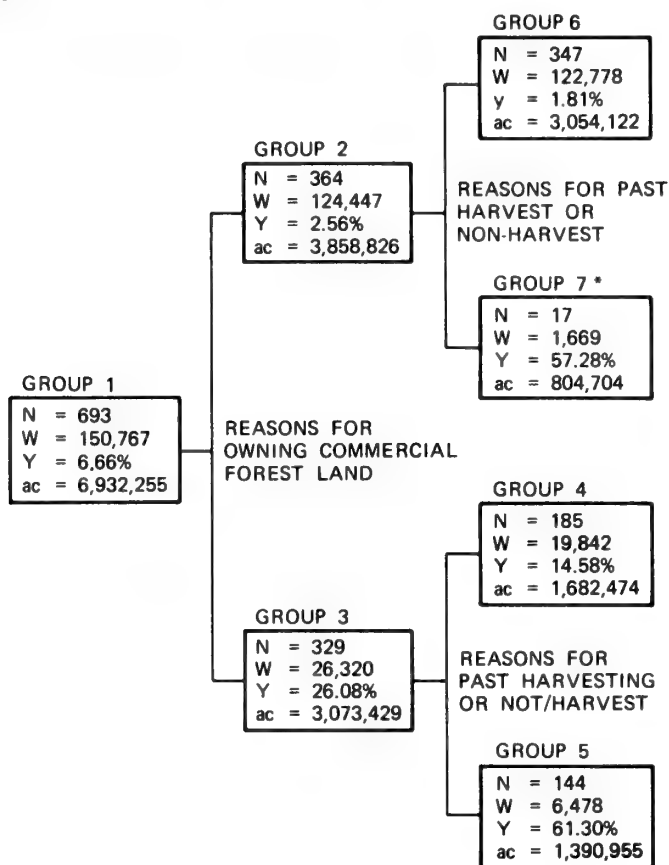
Only questionnaires from those respondents who answered the question about future intention to harvest could be used in this analysis. Thus, of the 716 samples taken in New Hampshire and Vermont, 693 were used in this analysis. These responses represented an estimated 150,767 owners and accounted for an estimated 6,932,255 acres of commercial forest land or about 86 percent of the total for the two states.

Analysis 1: Intention to Harvest Some Time During the Next 5 Years.

Group 1 (fig. 5) represents all the samples included in this analysis. Only 6.7 percent of the owners replied that they intend to harvest during the next 5 years. These owners hold 45 percent of the commercial forest land in the analysis—3,119,500 acres.

Group 1 was divided in Groups 2 and 3, based on the owner's reason for owning forest land. A total of 31 combinations of possible answers were developed, based on the two most important reasons the owner listed for owning forest land. Only 2.6 percent of the respondents in

Figure 5.—Analysis 1: intention to harvest within the next 5 years.



N = NUMBER OF SAMPLES

W = ESTIMATED NUMBER OF OWNERS

Y = PROPORTION OF OWNERS WHO INTEND TO CUT IN NEXT 5 YEARS

ac = ESTIMATED ACREAGE OWNED BY GROUP

* = FINAL GROUP, NO FURTHER MEANINGFUL SPLIT POSSIBLE

Group 2 intend to harvest in the next 5 years. Group 3 had 26.1 percent who intend to harvest. The majority of the owners in Group 2 said that being part of their residence or an interest in recreation were the first or second reasons for owning forest land. The majority of the owners in Group 3 gave timber production or farm or domestic use as their land-owning objectives. The owners who listed land investment as an important objective were divided nearly evenly between the two groups.

The owners in Group 2 who intend to harvest in the next 5 years represent 1,419,200 acres of

commercial forest land. In Group 3 the owners who intend to harvest represent 1,700,300 acres.

Groups 2 and 3 were divided into Groups 4, 5, 6, and 7, based on the respondents' reasons for harvesting or not harvesting timber in the past. In Group 4, 14.6 percent of the owners said they intend to harvest in the next 5 years. The majority of the owners in Group 4 have never harvested timber in the past. Of those who had harvested in the past, most said they did so because they needed the timber for their own use or because they needed money. Those who had not harvested said they had not because

their timber was not mature or that they were opposed to timber harvesting.

In Group 5 most of the owners, 61.3 percent, intend to harvest within the next 5 years. Owners in this group own an average of 214 acres. Most of the owners in this group who have harvested said that they did so because the timber was mature, that they harvested in conjunction with land-clearing, or that they had harvested for company use.

Only 1.8 percent of the owners in Group 6 have any intention to harvest during the next 5 years. Many owners in Group 6 gave reasons for not harvesting that would be likely to preclude harvesting at anytime in the future, such as the belief that logging would destroy the scenery or that they had insufficient area for harvesting. That many owners in this group may in fact have an insufficient area to harvest is borne out by the fact that this group has the lowest average acreage of any of the 7 groups—only 25 acres.

People in Group 7 had only two reasons for past harvesting or not harvesting. The majority said they had harvested in the past because they needed the timber for their own use, and the remainder said they had not harvested in the past because the land had been tied up in an estate. The owners in Group 7 own an average of 482 acres each. Of these owners, 57 percent intend to harvest within the next 5 years.

Generally this analysis showed that the owner who is unlikely to harvest timber during the next 5 years usually owns less forest land than the average owner. He owns his land for recreational purposes or because it is part of his residence. He is also unlikely to have ever harvested timber from his land previously because he is philosophically opposed to harvesting, he has too little area for harvesting, or he feels that harvesting would destroy the scenery. If he in fact has harvested timber before, it is very likely he did so only because he needed money.

Those owners that are likely to harvest during the coming 5 years typically own large areas of forest land either for timber production or for farm or domestic use. They also have harvested before because the timber was mature, or for company use or their own use, or because they were clearing some land. If they have not harvested in the past it was probably because the land is part of an undivided estate.

Analysis 2: Intention to Harvest Some Time During the Next 10 Years.

Group 1 in figure 6 represents all the samples included in the analysis. This analysis proved to be nearly identical to Analysis 1. However, it uncovered an additional 4,862 owners who plan to harvest some time between 5 and 10 years from now. Thus 9.9 percent of the owners intend to harvest within the coming 10 years, and they own 53 percent of the commercial forest land in the analysis.

Analysis 3: Intention to Harvest at Some Time in the Future.

This analysis included all those owners in Analyses 1 and 2 plus those owners who reported that they intend to harvest “some day”, but were unable to specify a time frame or plan the harvest at some time beyond the 10-year horizon. Group 1 (fig. 7) represents all the samples included in this analysis. Of the 150,767 owners estimated to be in this group, 56,980 plan to harvest timber from their land some day. These owners hold 87 percent of the privately owned commercial forest land.

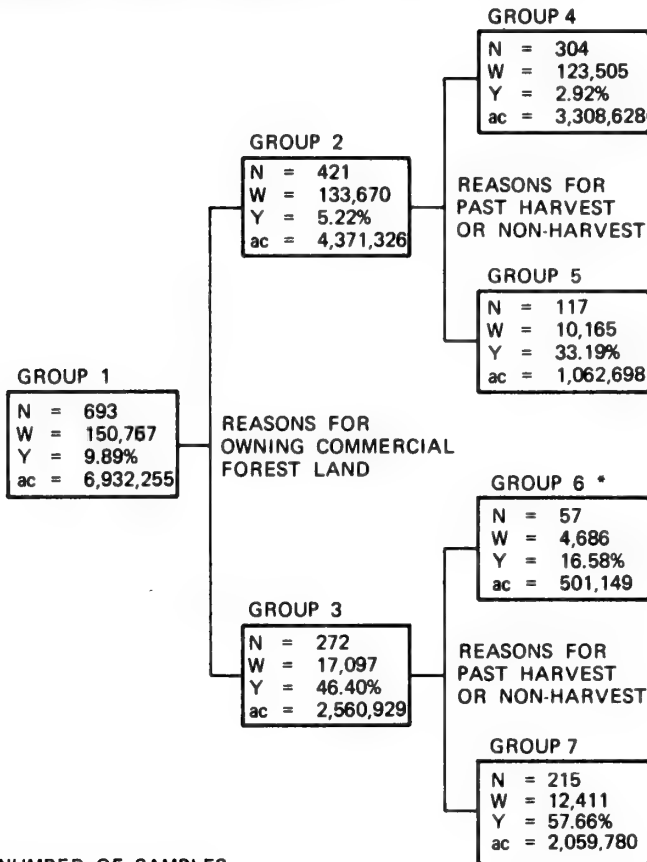
Group 1 was divided into Groups 2 and 3 on the acreage of forest land owned in the State by each respondent in the analysis. Group 2 contains all the owners of fewer than 20 acres. Owners in this group hold an average of 4 acres each, and 83 percent of them reported that they never intend to harvest timber.

Group 3 contains all the owners of 20 acres or more, and 79 percent of these owners said that they intend to harvest timber some time in the future. The owners in this group hold 129 acres on average.

Because Group 2 contained only 49 samples, a significant further split could not be obtained. However, Group 3 was further divided into Groups 4 and 5, based on the owners’ reasons for harvesting or not harvesting in the past. All the owners in Group 4 have never harvested in the past and many reported that they did not for fear that the scenery would be destroyed. In Group 4, 42 percent of the owners said they plan to harvest some time. The average number of acres owned by owners in Group 4 was 89.

In Group 5, 88 percent of the owners, with an average acreage of 139 acres, said they plan to harvest some day. The majority of the owners in Group 5 have harvested in the past. These owners often said that they harvested because the timber was mature, that they needed

Figure 6.—Analysis 2: intention to harvest at some time during the next 10 years.



N = NUMBER OF SAMPLES

W = ESTIMATED NUMBER OF OWNERS

Y = PROPORTION OF OWNERS WHO INTEND TO CUT IN NEXT 10 YEARS

ac = ESTIMATED ACREAGE OWNED BY GROUP

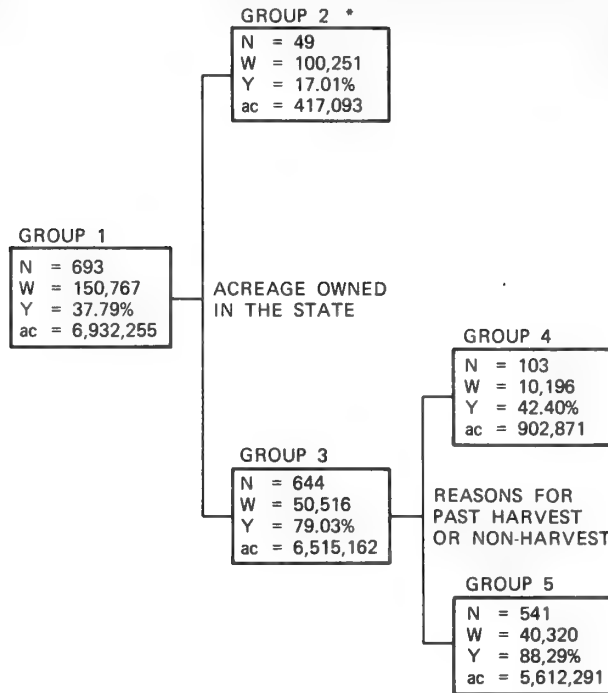
* = FINAL GROUP, NO FURTHER MEANINGFUL SPLIT POSSIBLE

money, or that they needed the timber for their own use or for company use. Those owners who have not harvested gave reasons like the fact that their timber was immature, that they did not have enough volume, or that the timber was of poor quality.

A comparison of Analyses 1 and 2 with Analysis 3 showed that, though relatively few owners have definite timber-harvesting intentions, a substantial number have a vague or undefined interest in harvesting timber. Generally, those with a well-defined interest in harvesting timber own substantial tracts. And, of course, those in forest industry fall in this group. Those with a poorly defined intention to

harvest generally hold intermediate-size tracts, and those with no intention to harvest hold small tracts. The belief has often been expressed that because only a small portion of commercial forest is held by owners who hold it for timber production—21 percent in New Hampshire and Vermont—little of the standing timber in an area is available for harvesting. The AID analysis showed that this is an erroneous conclusion. What was shown is that few owners give much thought to the timber and the income-producing potential of their forest land. And even fewer expend any effort to improve that productive potential.

Figure 7.—Analysis 3: intention to harvest at some future date.



N = NUMBER OF SAMPLES

W = ESTIMATED NUMBER OF OWNERS

Y = PROPORTION OF OWNERS WHO INTEND TO CUT AT SOME FUTURE TIME

ac = ESTIMATED ACREAGE OWNED BY GROUP

* = FINAL GROUP, NO FURTHER MEANINGFUL SPLIT POSSIBLE

HOW MUCH TIMBER IS AVAILABLE ?

Another major objective of this study was to estimate the volume of timber that might be available for harvesting. The answer or answers to this question will be influenced by how the estimator defines availability and what assumptions he uses to develop the estimate. The estimate itself will be influenced by many social and economic factors. The utility of any estimate is limited to the time to which it applies, because changing industrial situations, land and timber market conditions, and social and economic conditions can interact to determine how much timber could be brought to market.

When an owner says that he is or is not willing to harvest timber, it does not necessarily mean that the timber on his land will or will not

ever be harvested. The ownership of forest land is not static. An acre that is owned today by an owner who will not harvest may be owned tomorrow by someone who is very interested in timber production, and vice versa. In point of fact, 57 percent of the commercial forest land in New Hampshire and Vermont has been in the same ownership for fewer than 25 years and 27 percent for fewer than 10 years. Thus there is a better than 1 in 4 chance that any given acre will change hands during the next decade. If that acre is part of a small ownership, the chance is greatly increased. Table 9 of the appendix shows that 61,500 owners have held their land for fewer than 5 years. These owners hold, on average, less than 18 acres. At the opposite extreme, the 3,900 owners who have held forest land for 50 years or more hold an average of nearly 291 acres.

In approaching the question of availability we have chosen to make three separate estimates for each state, using three entirely different approaches.

New Hampshire

First, the high or optimistic estimate. The previous AID analyses indicated, and table 21 confirms, that in New Hampshire 86 percent of the commercial forest land is owned by owners who express a willingness to harvest timber. Thus, we might say that a total of 3,501,300 acres is available to harvesting. Since there is no basis for concluding that this land is any more or less adequately stocked or productive than the average of all commercial forest land in New Hampshire, we may conclude that there are 4.8 billion cubic feet of growing-stock inventory, and that 172 million cubic feet of net annual growth is available for harvesting. The available inventory volume would be the total supply of available growing stock, and the available net annual growth may be taken as the volume that could be removed annually without depleting the total supply.

The weakness of this admittedly optimistic estimate is that group of owners who expressed an indefinite intention to harvest. These owners account for 31 percent of the privately owned commercial forest land in New Hampshire. How many of these owners, if approached to sell timber, would in fact place such unreasonable restrictions on harvesting, would demand such a high stumpage price, or would have such a poor logging chance as to make their timber, for all practical purposes, unavailable? We must recognize that just because an owner expresses a willingness to harvest does not mean he necessarily has now or ever will have timber available for harvesting. To develop a more realistic estimate we have taken a different approach to this question.

The owners of an estimated 1,432,100 acres of private commercial forest land in New Hampshire have not harvested timber in the past. Many of these owners have not for reasons that would seem to preclude the possibility of a timber harvest during the present owner's tenure. These reasons are:

1. Logging would destroy the scenery.
2. The owner distrusts loggers.

3. The owner feels he has an insufficient area to permit harvesting.
4. The owner is opposed philosophically to the harvesting of timber from his land.
5. The owner feels that harvesting would destroy the land for hunting or wildlife.
6. The owner is in the process of selling the land.
7. The land is tied up in an estate settlement.
8. Logging, in the owner's opinion, would constitute a fire hazard.

In all, it is estimated that the owners of 841,200 acres of commercial forest land would give one or more of these reasons for not harvesting. Subtracting this acreage from the 4,082,100 acres of privately owned commercial forest land in the State leaves 3,240,900 acres. However, this cannot be considered the current base of available land because an additional 82,200 acres are held by past harvesters who report that they will not harvest in the future. This acreage must also be subtracted, further reducing the base to 3,158,700 acres or 77 percent of the commercial forest land in private ownerships. Applying the same criteria as earlier, we can say that there are 4.3 billion cubic feet of available growing-stock inventory and 155 million cubic feet of net annual growth available.

A minimum estimate may be obtained by looking at what owners say they intend to do. The owners of an estimated 2,225,100 acres in New Hampshire intend to harvest sometime within the coming 10 years. Since these people have rather definite plans, it seems reasonable to assume that they own mostly larger timber and larger tracts.

If we assume that in any single year 10 percent of these owners will offer their timber for harvesting, we can estimate that 620 potential timber sellers will be in the market. According to Herrick (1975) the median acreage of logging operations in the Northeast is 100 acres, and a median volume of 700 cubic feet is removed from each acre. If we assume that these median values hold for New Hampshire, we can make an estimate of the volume that may be available. If there are 620 owners who will offer their timber for harvesting, then there will be 62,000 acres (620 x 100) that will be available for harvesting. If the median volume removed is 700 cubic feet, then we can expect that 43.4 million

cubic feet (62,000 x 700) of timber will be made available.

In 1972, 54.2 million cubic feet of growing stock was removed from privately owned commercial forest land in New Hampshire (*Kingsley 1976*). This would indicate that many owners in New Hampshire harvest timber without previous long-range plans.

Vermont

In Vermont 88 percent of the privately owned commercial forest land is owned by people who have expressed a willingness to harvest timber. Thus there are 3,517,300 acres available for harvesting. In Vermont this represents 3.8 billion cubic feet of inventory and 84.8 million cubic feet of annual net growth.

Taking the second approach, we find that the owners of 1,352,100 acres of private commercial forest land in Vermont have not harvested timber. A total of 526,900 acres is held by owners who have not harvested for reasons that would preclude a future harvest. And an additional 90,200 acres are owned by persons who have harvested timber but report that they do not plan to do so again. This leaves a timber-producing acreage of 3,371,200 acres. Thus, applying the same criteria as earlier, we conclude that there are 3.6 billion cubic feet of available inventory and 81.2 million cubic feet of available annual net growth.

Taking the third approach, we find that 10,800 owners in Vermont say that they intend to harvest some time within the coming 10 years. This means that about 1,080 potential timber sellers will be in the market annually. Using the same set of assumptions used in New Hampshire, we estimate that 108,000 acres will be available for harvesting in Vermont, containing a total available volume of 75.6 million cubic feet.

In 1972, 40.0 million cubic feet of growing stock was removed from Vermont's privately owned commercial forest land (*Kingsley 1977*). In that same year 96.1 million cubic feet were grown on private land in the State. Thus we find that in Vermont more timber was grown than was harvested and, since theoretically 75.6 million cubic feet was available, it would appear that more was offered for harvesting than was demanded.

Interpreting the Estimates

Of these three different estimates of available timber in each state, which is most nearly correct depends largely upon what the user of these data really means when he asks "How much timber is available?" If he wants to know what portion of the total volume is held by owners who are willing to harvest timber, regardless of the size, condition, or location of the timber, or of any unrealistic restrictions the owner might place on logging, then the first estimate answers his question.

If, however, the user wishes to know, based on past performance, how much volume is held by owners who would if approached agree to harvest, he will be satisfied with the second estimate. But, if he wishes only to know how much volume will be offered for harvesting, his best estimate is the third.

There is still another way of looking at these three estimates. The third estimate would represent that volume of timber that will be offered under present conditions without any expanded effort to obtain more timber. The second estimate represents a practical ceiling. If all the growth on land held by willing harvesters could be harvested annually, this would be the limit. If, however, it were possible to realize the annual growth on all the land held by those owners who express a willingness to harvest, however vague it may be, this then is the upper limit.

Although no attempt has been made to eliminate the acreage in forest-industry ownerships, the user of these estimates should keep in mind that much, if not most, of the timber on these lands is not available on the open market. This captive timber is usually held for the exclusive use of the owner. However, in recent years many forest industries have sold stumpage, particularly when they could realize a higher return than if they held it as reserve for their own use. This is often true when a wood-pulp manufacturer chooses to sell quality saw-timber as either stumpage or logs rather than to use this material as lower value pulpwood.

REASONS FOR HARVESTING OR NOT HARVESTING

We have previously shown that the reason an owner has or has not harvested timber in the past can be a significant predictor of his future harvesting plans.

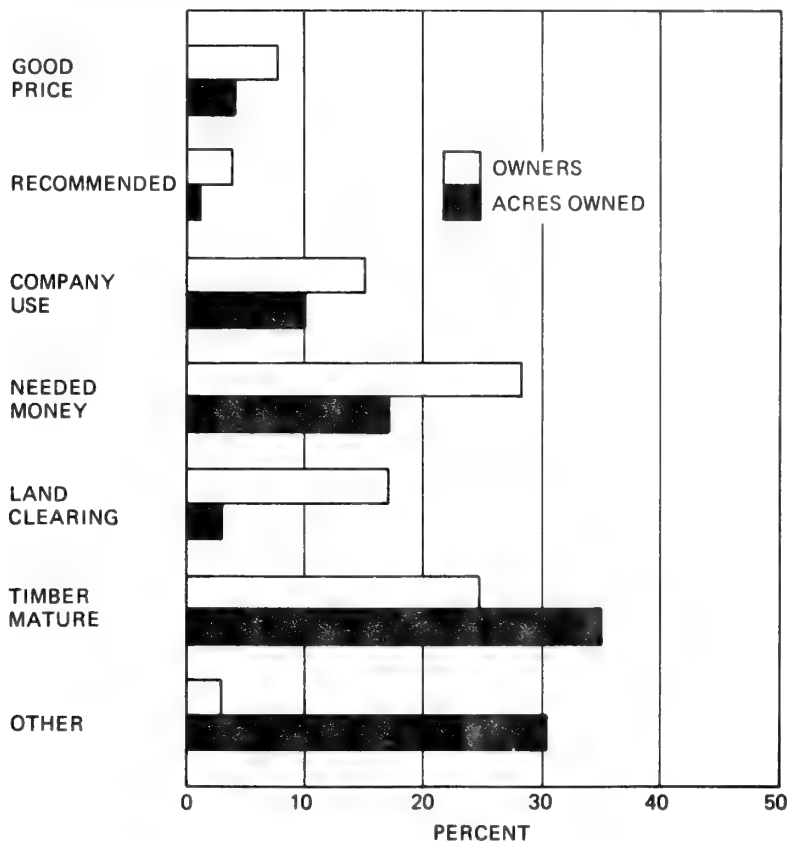
Why Owners Harvest Timber

The most prevalent reason given for harvesting timber was the need for money (fig. 8). An estimated 10,900 owners—28 percent—gave this reason. These owners control 17 percent of the commercial forest land in the two states, about 883,900 acres. Since many of these owners obviously hold relatively small tracts of timber, it would seem reasonable to

conclude that few of them perceived any timber value in their forest ownership until an emergency need for money confronted them. Many apparently have the attitude that they'll let their timber grow until they need money. This attitude is apparently more prevalent in Vermont. Of the 10,900 owners who gave this reason for harvesting, an estimated 7,400 owned land in Vermont.

The second most common reason for harvesting was that the timber was mature. An estimated 9,800 owners—25 percent—gave this reason, and they hold 35 percent of the commercial forest land in the two states. These owners hold an average of 189 acres of commercial forest land. Because these owners hold somewhat larger tracts, and because they harvested their timber when it was mature, there is reason to believe that this group of forest-land owners have a more conscientious

Figure 8.—Reasons for harvesting timber in NEW HAMPSHIRE and VERMONT, by percentage of acreage and owners, 1973.



attitude toward their land. Indeed many are undoubtedly actively managing their land to one degree or another.

The third most common reason for harvesting was land-clearing. Seventeen percent—6,800 owners—harvested for this reason. These owners typically own small tracts of forest land; they account for only 3 percent of the land held by harvesters.

It is interesting to note that only 4 percent of the owners who harvested said they did so because it was recommended by a forester. These owners hold only 1 percent of the forest land held by harvesters. Also, only a very few owners reported that they harvested timber in order to improve the condition of their forest stands.

Why Owners Do Not Harvest Timber

Three major groups of owners account for 74 percent of the owners who have not harvested timber. These groups are: those owners who have not harvested because their timber was im-

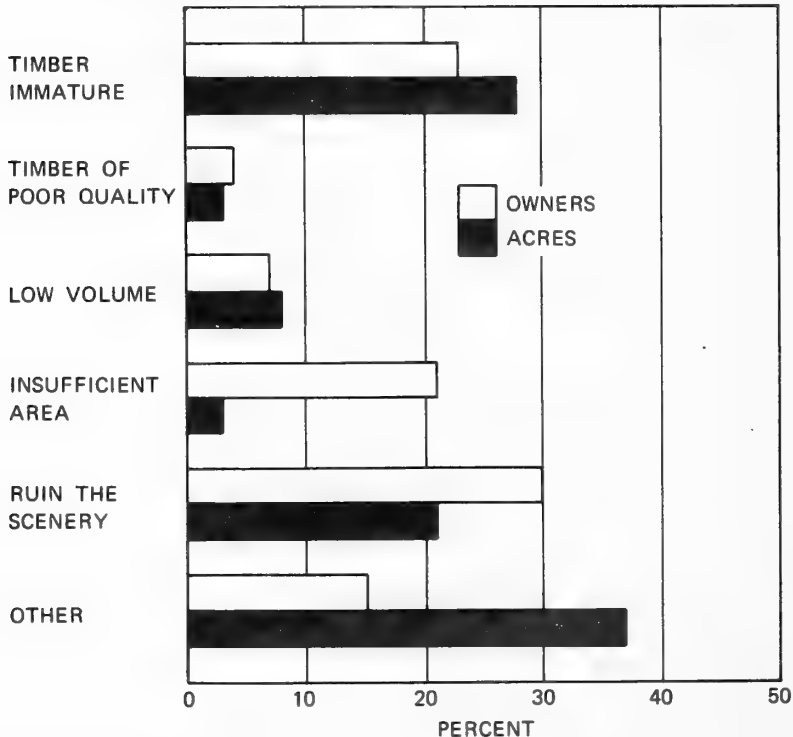
mature, those owners who feel that harvesting would destroy the scenery, and those owners who feel that they have an insufficient area for timber harvesting (fig. 9).

The 28,200 owners who have not harvested because their timber is immature own 773,900 acres or 28 percent of the forest land held by nonharvesters. The average acreage owned by these owners is 27 acres; somewhat below the averages of 52 in Vermont and 47 in New Hampshire. However, most tracts, while small, would still be operable by most logging contractors (*Herrick 1975*).

The 26,000 owners who did not harvest because they felt they did not have a sufficient area for logging appear to be justified in their reasoning. This group averaged only 3 acres per owner, or a total of 79,800. Areas this small are not likely to be of interest to timber buyers unless they are stocked with trees of unusually high value.

The 38,000 scenery-conscious owners hold an average of 15 acres—a total of 579,700. In many instances such tracts surround the owner's

Figure 9.—Reasons for NOT harvesting timber in NEW HAMPSHIRE and VERMONT, by percentage of acreage and owners, 1973.



residence or his second home; when this is the case, the possible effect of logging on scenery can be a significant deterrent to harvesting. With an average acreage owned as low as 15 acres, it is also true that many such ownerships are too small to provide realistic logging chances.

Such deterrents as low stumpage price, distrust of loggers, or a philosophical objection to harvesting were unimportant as reasons for not harvesting. Only 3 percent of the nonharvesting owners gave one of these reasons, and they control only 9 percent of the commercial forest land.

TIMBER-HARVESTING PRACTICES

Harvesting System

The definition of the various harvesting systems used in this report have been abbreviated and therefore do not agree with the more complete definitions that would be accepted by the forestry profession. Such abbreviated definitions are necessary in order to permit lay respondents to answer the question. For instance, in our questionnaire the selection system is defined as "only preselected, marked trees were removed" and clearcutting is defined as "most or all of the trees on a given area were removed". Undoubtedly many owners have reported heavy selection cuts as clearcutting. For these reasons the data presented in this section should be interpreted as indicating how the owners view the harvesting method used and not as the silvicultural system used in managing these stands.

The most commonly used method of determining which trees would be harvested is the diameter-limit method, which was chosen by 11,000 owners. With this method all harvestable trees of the species to be harvested except those smaller than a specified diameter at breast height are cut.

Although this is the most commonly used method in the two states, it is far more prevalent in Vermont. In that state 36 percent of the owners who harvested reported that this was the method used. These owners control 37 percent of the private commercial forest land held by harvesters. By comparison, diameter-limit harvesting was used by 17 percent of the

New Hampshire harvesters, and they hold 31 percent of the land held by harvesters in that state.

The selection system of harvesting was the second most commonly used method in both states. In New Hampshire, 18 percent of the harvesting owners used this method, and in Vermont 27 percent. In New Hampshire the selection system was used on ownerships involving 32 percent of area held by harvesters and in Vermont on 33 percent.

Clearcutting was used by 14 percent of the harvesting owners in each state. However, it appears that these were generally owners of smaller than average tracts, because they account for only 5 percent of the acreage in New Hampshire and 6 percent in Vermont.

In New Hampshire 32 percent of the owners who have harvested said they did so in the process of land-clearing. These were owners of small tracts as indicated by the fact that these owners hold only 4 percent of the land held by harvesters. In Vermont, on the other hand, only 7 percent indicated land-clearing as a reason for harvesting; they hold 2 percent of the land held by harvesters. The prevalence of land-clearing in New Hampshire may be ascribed, in part, to the more forested character of that state. As of 1973 New Hampshire was 86 percent forested, and Vermont was 76 percent forested. Thus it may be that some owners in New Hampshire have cleared some of their land simply because the forest obstructed a desired view.

Who Selects the Timber to be Harvested?

Forty-nine percent of the landowners who have harvested reported that they selected the area or the timber to be harvested themselves. This does not mean that they physically marked each tree or delineated the cutting boundary. What it does mean is that they consider themselves responsible for the final decision. These owners accounted for 23 percent of the acreage held by harvesters.

Foresters selected the timber to be harvested on 35 percent of the acreage held by harvesters. This fact indicates that the larger the ownership, the more likely the owner is to use the services of forester. In fact, the acreage held by owners who used the services of a forester—1,861,200—was larger than any other.

Overwhelmingly, foresters chose the selection system. Out of the 5,500 ownerships on which a forester was responsible for selecting the timber, the selection system was chosen in 5,300 cases. In fact, of all the owners who used the selection system, foresters were responsible for the choice 58 percent of the time. The selection system was used on ownerships totaling 1.7 million acres, and foresters made the selection on 1.2 million of these.

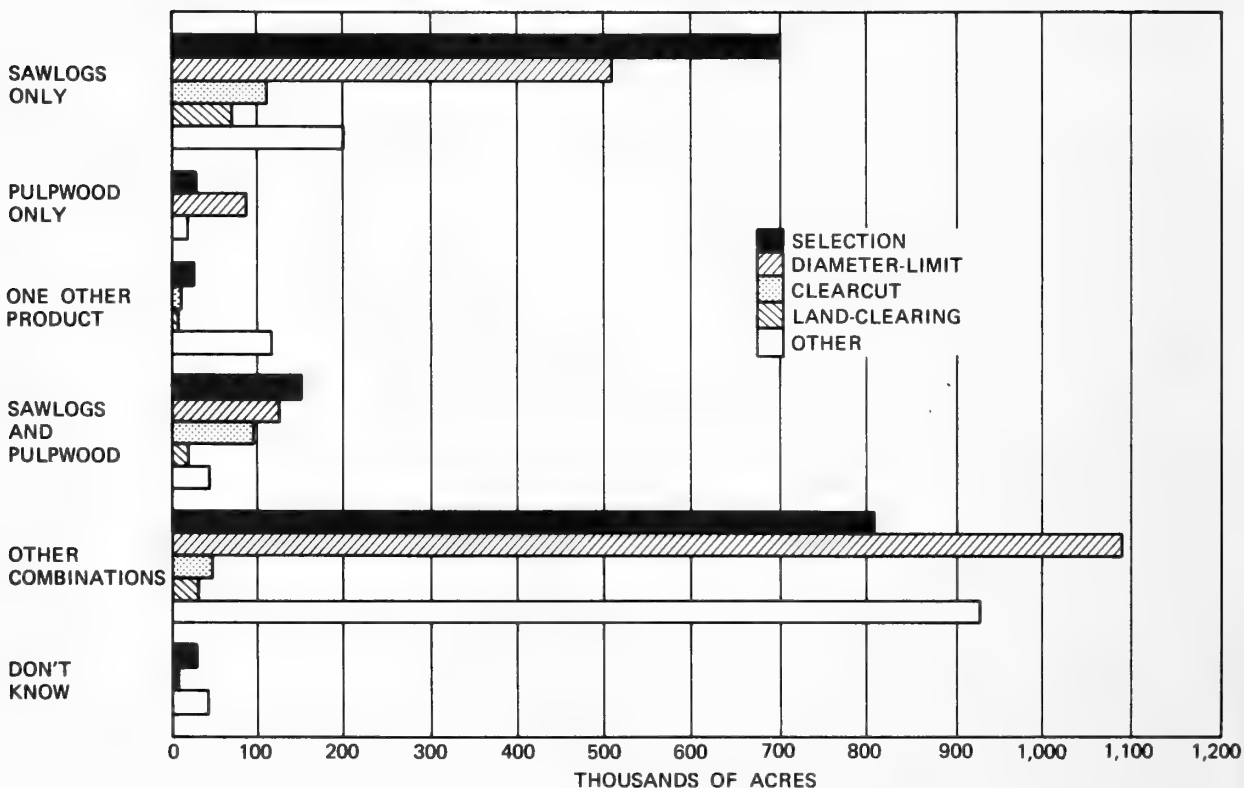
Timber buyers and landowners seem to prefer the diameter-limit system. An estimated 4,300 landowners chose this system, as did 3,700 timber buyers. When the landowner and the buyer together collaborated on the choice of timber to be harvested, 2,100 chose the diameter-limit system. Foresters, however, chose the diameter-limit method on only an estimated 200 ownerships. The popularity of the diameter-limit method with landowners and buyers is probably because it is less expensive and less difficult to administer than the selection system but does not leave an unsightly appearance as does the clearcutting system.

Clearcutting is also popular with landowners and buyers. Of the 5,300 owners who opted for this method, the decision was made by the owner himself in 3,800 cases and by the buyer in 1,300. Fewer than 50 owners who used the services of a forester chose this method of timber harvesting.

Products Harvested

More owners—17,400—harvested only sawlogs from their land than any other product or group of products (fig. 10). These owners accounted for 30 percent of the land held by harvesters—1.6 million acres. Pulpwood alone was harvested by only 4 percent holding only 2 percent of the land. The low incidence of pulpwood harvesting alone may be partially explained by the facts that there is a trend toward multiproduct harvesting in the Northeast, and except for clearcutting or land clearing, a harvest for only pulpwood in the stands of mixed size classes that are typical of both states would often imply some type of thinning.

Figure 10.—Harvesting system used and product harvested in NEW HAMPSHIRE and VERMONT, by acreage owned, 1973.



Because active intensive forest management is rare in both states, the latter is not likely.

The integrated or multiproduct harvest has become a commonplace occurrence in New Hampshire and Vermont. Thirty-five percent of the owners who have harvested reported that they harvested more than one product. These owners account for 64 percent of the land held by harvesters. The larger the ownership, the more products the owner harvests. The fewer than 50 owners who harvested 5 or more products account for 24 percent of the land held by harvesters.

FORESTRY ASSISTANCE

An estimated 18 percent of the owners of private commercial forest land have received some form of forestry assistance. However, these 18 percent control 53 percent of the acreage in the two states. The comparison of these estimates reinforces the conclusion that, the larger the area owned, the more likely the owner is to actively manage his land.

In fact, even though more owners—8,600—had assistance in timber-sales administration than in any other form of forestry assistance, the estimated 5,000 who received general forest-management assistance account for 55 percent of the acreage held by those receiving assistance—nearly 2.3 million acres. Obviously many very large industrial as well as individual owners either employ full-time foresters or have a forester available to them on a regular basis.

In Vermont more owners—an estimated 3,700—received assistance with tree planting than any other service. However, in New Hampshire tree planting ranked sixth in order of the services rendered. The already heavily forested character of New Hampshire may in part explain the difference.

The owners of small tracts of forest land often do not know where to obtain forestry services. An estimated 83,600 owners—51 percent of the total—when asked “What office, agency, or individual would you contact for forestry assistance?” replied that they didn’t know. These owners, however, own an average of little more than 20 acres each. Although more owners in Vermont report that they do not know where to obtain forestry assistance, those who do not know in New Hampshire own larger tracts than

those in Vermont—17 acres compared to nearly 24 acres on average.

Most New Hampshire and Vermont forest-land owners who did claim to know who to contact, said they would contact “the county” for forestry assistance. Presumably these owners mean either that they would contact the county forester or the county agent. In both states the county forester, so called, is the front line of public forestry assistance. In New Hampshire the county forestry program is administered jointly by the Department of Resources and Economic Development and the Cooperative Extension Service. In Vermont county foresters share offices, in most cases, with the Cooperative Extension Service, although they come under the direction of the Director of Forests. On average those owners who indicated that they would contact the county own 60 acres. However, the two states are not alike in this respect. The Vermont group own an average of 74 acres while those in New Hampshire average 45 acres.

Three percent of the owners said that they would contact a consulting forester. These 4,800 owners hold a little over 600,000 acres of private commercial forest land or an average of 127 acres each. In New Hampshire the owners who say they would contact a consulting forester own an average of over 160 acres each, but in Vermont they own an average of only 42 acres.

RECREATION ON PRIVATE FOREST LAND

Most owners of commercial forest land in New Hampshire and Vermont permit the general public to use their land for one form of outdoor recreation or another. Only 24 percent of the owners permit camping. These owners hold 36 percent of the privately owned commercial forest land. At the high end, 51 percent permit hunting, 51 percent permit hiking, and surprisingly, 50 percent permit snowmobiling. The owners who permit hunting hold 75 percent of the land, hiking 73 percent, and snowmobiling 59 percent.

The most likely reason so few owners permit camping is that this use usually involves some form of site degradation, littering, and fire hazard. This conclusion is strengthened by the fact that only 36 percent of the owners permit

picnicking, a use that is also often associated with these same problems. On the other hand, hiking and hunting, both of which are transitory in nature, usually involve little site degradation or littering.

Although 51 percent of the owners permit some form of recreation, 69 percent do not post their land against either hunting specifically or trespassing in general. Of the 50,300 owners who do post their land, an estimated 15,200 did so in order to insure their privacy. These owners hold over one-half million acres. Another 10,200 owners posted to limit access to their land. These owners accounted for more forest land than any other group. Often when an owner indicates that he wishes to limit access to his land he desires to know who is using his land and for what purpose they are using it. In this way he is able to exclude those individuals he deems unsuitable without being forced to explain his reasons.

Only 17 percent of the owners, owning 21 percent of the private forest land, said they posted their land primarily to exclude hunters. Yet, a frequent complaint heard from hunters is that too much land is posted. In most cases, it appears, if hunters or any other recreationist presents himself to the owner he is likely to obtain permission to use the land. Conversely, just because the land is not posted does not mean that it is available for use by hunters or any other recreationists. This fact is obvious when one compares the estimate of the number of owners who do not permit use of their land by the general public—49 percent—with the estimate of those who do not post their land—69 percent.

CONCLUSIONS

The results of this study show that most forest-land owners in New Hampshire and Vermont take an active interest in their forest land and, in fact, consider it a valuable possession. Many owners are former urbanites, somewhat more affluent and somewhat older than the

general population of the two states. Among individuals, the desire to hold forest land for amenity values is prevalent. This conclusion is evidenced by the fact that a large majority of the present forest-land owners in the two states indicated that they owned forest land for recreational reasons, because it was part of their residence, or that they enjoyed the open or "green space".

Despite this apparent predilection toward a nontangible interest in forest land, most New Hampshire and Vermont forest-land owners show little or no negative attitude toward timber harvesting or forest management. For this reason it would appear that opportunities for active forest management and an accompanying expansion in timber harvesting are plentiful, provided they take into account the owner's primary reasons for owning his land and those benefits he wishes to derive from the ownership of forest land. If foresters or timber buyers expect to encourage forest management or timber harvesting in the private-noncorporate sector by appealing to the classical justifications for forestry and timber production—namely increased timber production, income, and protection of the forest complex—they will be doomed to almost certain failure. On the other hand, if they choose to gear their efforts toward enhancing those values and benefits the owner wishes to obtain from his forest land, they may meet with greater success in the long run.

Both New Hampshire and Vermont have established traditions of concern for the environment and landscape. This is evidenced by the concern in both states for adequate land-use planning and protection of the esthetic quality of the landscape. Few states are as far along toward what Aldo Leopold called a "conservation ethic". With this public attitude and the attitudes of forest-land owners specifically as expressed in this study, these states are fertile ground for active broadscale multipurpose forestry.

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APPENDIX

I

Study Method

The sampling scheme used for this study was derived from the sampling design used in the Forest Survey conducted by the Northeastern Station. Forest-Survey field crews attempted to obtain the correct name and mailing address of the owner of each of the 1,363 privately owned forested field plots in the two states (New Hampshire—748, Vermont—615). The field crews were able to obtain usable addresses for nearly 90 percent of the field plots. A total of 1,062 questionnaires were mailed to owners of commercial forest land in the two states. A total of 716 were returned with usable information (New Hampshire—367, Vermont—349).

The questionnaire used in this study was developed after investigation of several earlier ownership studies and consultations with other investigators. The questionnaire was also field-tested before the mass mailings. The mailing consisted of the questionnaire plus a cover letter explaining the purpose of the survey. Approximately 2 weeks after the first mailing, those addresses who had not responded were mailed a second copy of the questionnaire and its cover letter plus a second letter urging cooperation with the study. Approximately one month later, 596 owners had responded. Then a 100-percent field canvass of nonrespondents was attempted. This effort resulted in an additional 120 usable questionnaires (New Hampshire—66, Vermont—54).

The resulting data were compiled by electronic computer, using the FINSYS generalized computer system.¹

Since the sampling scheme used in this study is essentially the one used in the forest survey of timber resources, it introduces a bias because the sample is proportional to the forest area being sampled and not proportional to the number of owners of forest land. To overcome this bias it was necessary to weight the numbers

of owners obtained in the sample. This procedure can be stated mathematically as:

$$wx_i = \frac{CFLp/Nr}{A_i}$$

and $\sum wx_i$ = estimated number of private owners in the state.

where

wx = weighted number of private owners represented by the respondent.

$CFLp$ = area of privately owned commercial forest land in the state.

Nr = number of respondents in the survey.

A_i = acres owned by individual respondent.

The sum of the weighted number of owners then provides an unbiased estimate of the total number of persons who own commercial forest land in New Hampshire and Vermont.

The acreage of commercial forest land was estimated in a manner similar to that used in the forest survey. The total area of privately owned commercial forest land in each state was divided by the number of field plots represented in the ownership canvass. Thus, if a particular respondent owned land on which one forested plot was located, his response was given a weight of one. If a respondent represented two forested plots, his response received a weight of two or double the acreage, and so on. Actual reported acreage was used only to calculate the sample mean, mode, and median.

It was also necessary to determine if those questionnaires obtained through the mail and those obtained by means of the field follow-up were both samples of the same population. The hypothesis tested was that there was no significant difference in the mean acreage of the subsamples. Student's t-test showed that no significant difference existed at the 99-percent probability level.

Because this study encompassed a two-state region, it was necessary to make the calculations for each of the two states and then sum the results. The following tabulations show the pertinent data for each of the states:

¹ Wilson, Robert W., Jr., and Robert C. Peters. The Northeastern Forest Inventory Data Processing System. I. Introduction. USDA For. Serv. Res. Pap. NE-61. 20 p., illus. 1967.

	<i>Questionnaires mailed (No.)</i>	<i>Usable returned questionnaires (No.)</i>	<i>Plots represented by returned questionnaires (No.)</i>	<i>Acreage represented per plot (Acres)</i>
New Hampshire	562	367	513	7,957
Vermont	500	349	413	9,657
Both states	1,062	716	926	--

APPENDIX II Sampling Errors

Sampling errors were calculated for the estimated total number of forest-land owners in each state and for the combined total. The sampling error for the number of acres of commercial forest land in private ownership was calculated as part of the forest survey. These sampling errors are presented below. The user of these data is cautioned that, as the size any estimate decreases in relation to the total estimate, the sampling error, expressed as a percentage of the estimate, increases drastically.

The inclusion of small woodland parcels (less than 10 acres) in the study population substantially influences the sampling error for the estimated number of owners. For example, the sampling error for the estimated total number of owners in New Hampshire is ± 16.4 percent; eliminating the owners of tracts of less than 10 acres, it becomes ± 8.5 percent. Similarly, in Vermont the sampling error is reduced from ± 21.6 percent to ± 7.1 percent:

For a discussion of the method of calculating these sampling errors, see: Cochran, William G. 1963. *SAMPLING TECHNIQUES*. 2d. ed., p. 252 (9.10 Theory for selection with arbitrary probabilities). John Wiley & Sons, Inc., New York.

Sampling error for:

	<i>Acres of private Commerical forest land</i>	<i>Number of owners of private commerical forest land</i>
New Hampshire	$\pm 40,800 (\pm 1.0\%)$	$\pm 14,400 (\pm 16.4\%)$
Vermont	$\pm 119,600 (\pm 3.0\%)$	$\pm 16,700 (\pm 21.6\%)$
Total	$\pm 126,400 (\pm 1.6\%)$	$\pm 22,100 (\pm 13.4\%)$

APPENDIX

III

Questionnaire

NE FOREST EXPERIMENT STATION
FOREST SERVICE, U.S. DEPARTMENT OF AGRICULTURE

OMB
Approval expires:

NORTHEASTERN WOODLAND OWNERSHIP STUDY

State _____

County _____

Plot _____

Please complete the following questions to the best of your knowledge. Where actual data are not available please use your best estimate. Please be assured your answers will be held strictly confidential.

1. How much land do you now own? (Include woodlands, pasture, cropland, etc., but exclude individual house lots.) Acres _____

2. Of all of the land you own how much is woodland? Acres _____ or percent _____

3. Is all of the woodland you own in one state?

Yes 1. _____ What state _____

No 2. _____ My woodlands are in more than one state as follows:

_____ acres in _____ (state)

_____ acres in _____ (state)

_____ acres in _____ (state)

_____ acres in _____ (state)

4. How many individual tracts or parcels of woodland do you own? Number _____

5. In what year did you first acquire woodland? Year _____

6. How did you acquire the major portion of the woodland you now own?

Purchase 1. _____
Inheritance 2. _____
Other 3. _____

7. In which one of the following ownership categories does the major portion of your woodland holdings fall? (Please check only one.)

- Individual (include husband and wife) 1. _____
- Joint ownership 2. _____
- Undivided estate 3. _____
- Partnership 4. _____
- Corporation 5. _____
- Club or association 6. _____
- Other 7. _____

8. If the ownership is a partnership, corporation, club or association, what is the nature of the business or organization?

Please indicate the title of the person completing this questionnaire.

9. What is the approximate road mileage from your home to your nearest and furthest tract of woodland? (For businesses or organizations consider "home" to mean place of business, or location of organization.)

Miles to the nearest tract (enter zero if you live on the tract) _____
Miles to furthest tract _____

10. How many times have you or your representative visited your nearest and furthest tract of woodland in the last 12 months?

Number of visits to the nearest tract _____
Number of visits to the furthest tract _____

11. Have you ever harvested timber or trees from your land?

Yes 1. _____
No 2. _____

NOTE: IF YOU HAVE NEVER HARVESTED TIMBER OR TREES FROM YOUR WOODLAND SKIP TO QUESTION 18.

12. In what year did the most recent timber harvest take place? _____

13. What products were harvested? (Check as many as apply.)

Sawlogs	1.	_____	Mine timbers	6.	_____
Veneer logs or bolts	2.	_____	Christmas trees	7.	_____
Pulpwood	3.	_____	Other	8.	_____
Turnery bolts	4.	_____	(please specify) _____		
Posts, poles, or piling	5.	_____	Don't know what products were harvested	9.	_____

14. How were your trees selected for harvesting? (Please check the method that accounted for the greatest volume, if more than one method was used.)

Selection (only preselected marked trees were removed)	1.	_____
Diameter limit (only trees over a minimum diameter were removed) Please indicate minimum diameter _____	2.	_____
Clearcutting (most or all of the trees on a given area were removed)	3.	_____
Land clearing (trees were harvested incidental to clearing the land for a use other than woodland)	4.	_____
Other (please specify) _____	5.	_____
Don't know method used.	6.	_____

15. Who selected the area or trees to be harvested?

Landowner	1.	_____
Forester	2.	_____
Friend or neighbor	3.	_____
Timber buyer or logger	4.	_____
Combination of _____ and _____	5.	_____

16. If you did not have the assistance of a forester in the harvesting of your timber, do you now wish you had?

Yes	1.	_____
No	2.	_____
No feeling either way	3.	_____

17. Why did you harvest timber at the time that you did?
 (Check only the one reason you consider most important.)

Felt timber was mature	1.	_____
Offered a good price	2.	_____
Land clearing	3.	_____
Needed money	4.	_____
Needed timber for own use	5.	_____
Timber harvest for company use (industry only)	6.	_____

18. If you have never harvested timber or trees from your land, why not?
 (Please check only the reason you consider most important.)

Woodland immature - timber too small	1.	_____
No market for timber	2.	_____
Price offered or prevailing market price too low	3.	_____
Value of land for hunting would be destroyed	4.	_____
Selling or plan to sell the land	5.	_____
Scenery would be destroyed	6.	_____
Land tied up in estate	7.	_____
Distrust of loggers	8.	_____
Opposed to timber harvesting	9.	_____
Poor quality timber	10.	_____
No market for timber	11.	_____
Not enough volume	12.	_____
Logging would create a fire hazard	13.	_____
Insufficient area to harvest	14.	_____
Other (please specify) _____	15.	_____

19. Do you plan to harvest timber from your woodlands in: (Check one)

Next 5 years	1.	_____
5 to 10 years	2.	_____
Possibly at some future date	3.	_____
Never plan to sell timber	4.	_____

20. Have you ever sought the assistance of a forester for advice or help in managing your woodland?

Yes 1. _____ Please indicate the nature of assistance _____

No 2. _____

21. What office, agency, or individual would you contact for forestry assistance? (If you don't know, please write in "don't know.")

22. Why do you own woodland? (Please rank in order of importance those items that are applicable, with number 1 the most important.)

Land investment (hope to sell all or part of woodland at a profit) _____
Recreation (hunting, camping, fishing, etc.) _____
Timber production (growing timber or other forest products for sale) _____
Farm or domestic use (source of fence posts or other forest products for own use) _____
Part of my residence _____
Other (please specify) _____

23. Which of the following do you feel were the most important benefits you derived from your woodland in the last 5 years? (Please rank in order of importance those items that are applicable, with number 1 the most important.)

Increase in land value (investment) _____
Recreation (hunting, fishing, camping, etc.) _____
Income from the sale of timber _____
Aesthetics (just enjoy woodland, wildlife, and the general satisfaction of owning "green space.") _____
Farm or domestic use _____
Other (please specify) _____

24. Which of the following do you feel will be the most important benefits you expect to derive from your woodland in the next 5 years?

- | | | |
|---|----|-------|
| Increase in land value (investment) | 1. | _____ |
| Recreation (hunting, fishing, camping, etc.) | 2. | _____ |
| Income from sale of timber | 3. | _____ |
| Aesthetics (just enjoy woodland, wildlife, and the general satisfaction of owning "green space.") | 4. | _____ |
| Farm or domestic use | 5. | _____ |
| Other (please specify) _____ | 6. | _____ |

25. Is the general public, other than your family and immediate circle of friends, permitted to use your woodland for any of the following: (Please check all appropriate items.)

- | | | |
|------------------------------|----|-------|
| Hiking | 1. | _____ |
| Picnicking | 2. | _____ |
| Camping | 3. | _____ |
| Fishing | 4. | _____ |
| Hunting | 5. | _____ |
| Snowmobiling | 6. | _____ |
| Other (please specify) _____ | 7. | _____ |

26. My woodland is posted because: (Check the most important reason. If your land is not posted do not answer this question.)

- | | | |
|--|----|-------|
| Littering | 1. | _____ |
| Damage to property or livestock | 2. | _____ |
| Safety | 3. | _____ |
| Protection from liability | 4. | _____ |
| Control public access (I wish to know who is on my property and for what reason) | 5. | _____ |
| To keep hunters out | 6. | _____ |
| Privacy | 7. | _____ |
| Other (please specify) _____ | 8. | _____ |

27. Have you been approached to sell all or part of your woodland in the last five years?

Yes 1. _____ No 2. _____

The following questions are asked to classify responses on the basis of information about the owner personally. Again, we would remind you that the answers to these questions, and to any other questions on this questionnaire, are strictly confidential. All answers will be compiled in such a manner that it will be impossible to identify any individual reply.

These questions do not pertain to and should not be answered by corporations and organizations.

If the woodland is owned by more than one person, answer the questions for one of the owners only.

28. During the first 12 years of the owner's life where did he live most of the time?

- | | | |
|---|----|-------|
| In a city with a population of 100,000 or more | 1. | _____ |
| In a city with a population of 10,000 to 99,999 | 2. | _____ |
| In a town or city with a population of less than 10,000 | 3. | _____ |
| In a rural area | 4. | _____ |
| On a farm | 5. | _____ |

29. What is the sex of the owner?

Male 1. _____ Female 2. _____

30. What is the age of the owner?

- | | | |
|-------------|----|-------|
| Under 25 | 1. | _____ |
| 25-44 | 2. | _____ |
| 45-64 | 3. | _____ |
| 65 and over | 4. | _____ |

31. How many years of formal education has the owner completed?

- | | | |
|---|----|-------|
| Grades 1-8 | 1. | _____ |
| Grades 9-12 | 2. | _____ |
| Has some schooling beyond high school
(Business or technical school, or some college.) | 3. | _____ |
| Has a bachelor's degree or equivalent | 4. | _____ |
| Has some graduate work | 5. | _____ |
| Holds a master's degree | 6. | _____ |
| Holds a doctoral degree | 7. | _____ |

32. What is the primary occupation of the owner? _____

33. In which category would the owner's gross income fall?

- | | | |
|---------------------------|----|-------|
| Less than \$3,000 | 1. | _____ |
| \$3,000 to \$9,999 | 2. | _____ |
| \$10,000 to \$14,999 | 3. | _____ |
| \$15,000 to \$29,999 | 4. | _____ |
| \$30,000 or more per year | 5. | _____ |

34. Comments?

APPENDIX IV

Definition of Terms

Forest land.—Land that is at least 16.7 percent stocked (contains at least 7.5 square feet of basal area) by forest trees of any size, or that formerly had such tree cover and is not currently developed for nonforest use. (Forest trees are woody plants that have a well-developed stem and usually are more than 12 feet in height at maturity.) The minimum area for classification of forest land is 1 acre.

Commercial forest land.—Forest land that is producing or capable of producing crops of industrial wood (More than 20 cubic feet per acre per year) and is not withdrawn from timber utilization. (Industrial wood: all roundwood products except fuelwood.)

Private commercial forest land.—All commercial forest land other than that owned by federal, state, or local governments or their agencies.

Softwoods.—Coniferous trees that are usually evergreen, having needles or scalelike leaves.

Hardwoods.—Dicotyledonous trees that are usually broad-leaved and deciduous.

Stand.—A growth of trees on a minimum of 1 acre of forest land that is at least 16.7 percent stocked by forest trees of any size.

Growing-stock trees.—Live trees of commercial species that are classified as sawtimber, poletimber, saplings, and seedlings; that is, all live trees of commercial species except rough and rotten trees.

Growing-stock volume.—Net volume, in cubic feet, of live growing-stock trees that are 5.0 inches dbh and over, from a 1-foot stump to a minimum 4.0-inch top diameter outside bark of the central stem.

Sawtimber trees.—Live trees of commercial species: (a) that are of the following minimum diameter at breast height: softwoods 9.0 inches and hardwoods 11.0 inches; and (b) that contain at least one 12-foot merchantable sawlog and meet regional specifications for freedom from defect.

Sawtimber volume.—Net volume in board feet, International 1/4-inch rule, of merchantable sawlogs in live sawtimber trees. Net

volume equals gross volume less deductions for rot, sweep, and other defects that affect use for lumber.

Board foot.—A unit of lumber measurement 1 foot long, 1 foot wide, and 1 inch thick, or its equivalent. By forest-survey convention, softwoods less than 9.0 inches dbh and hardwoods less than 11.0 inches dbh do not contain board-foot volume.

Annual net growth.—The annual change (resulting from natural causes) in volume of sound wood in sawtimber and poletimber trees.

Timber removals.—The volume of growing stock or sawtimber trees harvested or killed in logging or in cultural operations such as timber-stand improvement, land-clearing, or changes in land use.

Forest industries.—Companies or individuals operating wood-using plants.

Timber salvage.—Removals of down, damaged, or diseased trees.

Selection system.—The method of timber harvesting in which trees of all sizes are harvested. However, in practice often only the oldest or largest trees in a stand are harvested. Trees are taken singly or in small groups, but the entire stand is never cleared off completely.

Clearcutting.—The method of timber harvesting in which the area is cut clear in the literal sense of the word; virtually all the trees, large and small, are removed. The term is often erroneously applied to any type of cutting in which all the merchantable timber is removed and all that is not merchantable is left.

Diameter limit.—The method of timber harvesting in which all trees above a specified diameter are removed.

Sawlog.—Any log from which lumber is to be sawed.

Veneer log.—Any log from which veneer is to be made either by peeling (rotary cut) or slicing.

Pulpwood.—Any log from which woodpulp is to be made. Usually measured in bolts of 4, 5, or 8 feet and somewhat smaller in diameter than either sawlogs or veneer logs.

APPENDIX

V

Tabular Data

Table 1.—Estimated number of private owners of commercial forest land and the acreage they own, by size-class and form of ownership in New Hampshire, 1973.

Table 2.—Estimated number of private owners of commercial forest land and the acreage they own, by size-class and form of ownership in Vermont, 1973.

Table 3.—Estimated number of owners of commercial forest land and the acreage they own, by ownership category and state, New Hampshire and Vermont, 1973.

Table 4.—Estimated number of individual owners of commercial forest land and the acreage they own, by occupation and state, New Hampshire and Vermont, 1973.

Table 5.—Age class of individual owners, by number of owners and acreage of commercial forest land owned, New Hampshire and Vermont, 1973.

Table 6.—Years of completed formal education for individual owners, by number of owners and acres of commercial forest land owned, New Hampshire and Vermont, 1973.

Table 7.—Individual owners by income groups, number of owners, and acres of commercial forest land owned, New Hampshire and Vermont, 1973.

Table 8.—Early life environment of individual owners, by number of owners and acreage of commercial forest land owned, New Hampshire and Vermont, 1973.

Table 9.—Period of ownership of commercial forest land, by number of owners and acres owned, New Hampshire and Vermont, 1973.

Table 10.—Distance owner's residence is from his nearest tract, by number of owners and acreage of commercial forest land owned, New Hampshire and Vermont, 1973.

Table 11.—Number of tracts of commercial forest land owned, by number of owners and total acreage they own, New Hampshire and Vermont, 1973.

Table 12.—Reason for owning commercial forest land, by number of owners, acres owned, and by state, New Hampshire and Vermont, 1973.

Table 13.—Reason for owning commercial forest land, by number of owners who have harvested timber and by the number of acres they own, by state, New Hampshire and Vermont, 1973.

Table 14.—Reason for owning commercial forest land, by number of owners who have not harvested timber and by the number of acres they own, by state, New Hampshire and Vermont, 1973.

Table 15.—Benefits derived from the ownership of commercial forest land in the last 5 years and benefits expected in the next 5 years, by numbers of owners who have and number who have not harvested timber and by the number of acres they own, New Hampshire and Vermont, 1973.

Table 16.—Reason for harvesting timber, by ownership groups, number of owners, and acres owned, New Hampshire and Vermont, 1973.

Table 17.—Reason for not harvesting, by ownership group, number of owners, and acres owned, New Hampshire and Vermont, 1973.

Table 18.—Forest products harvested, by number of owners and acres owned, by state, New Hampshire and Vermont, 1973.

Table 19.—Method of selecting timber to be harvested, by individual who selected the timber, by number of owners, and acres owned, New Hampshire and Vermont.

Table 20.—Method of selecting timber to be harvested, by product harvested, number of owners, and acres owned, New Hampshire and Vermont, 1973.

Table 21.—Expected time of future timber harvest, by number of owners and acres owned, by state, New Hampshire and Vermont, 1973.

Table 22.—Agency that owners would contact for forestry assistance, by number of owners and acres owned, by state, New Hampshire and Vermont, 1973.

Table 23.—Owners who have received forestry assistance, by nature of assistance, number of owners, and acres owned, by state, New Hampshire and Vermont, 1973.

Table 24.—Recreational uses permitted, by type of use, number of owners, and acres owned, by state, New Hampshire and Vermont, 1973.

Table 25.—Reason for posting land, by number of owners and acres owned, by state, New Hampshire and Vermont, 1973.

Table 1.—Estimated number of private owners of commercial forest land and the acreage they own, by size-class and form of ownership in New Hampshire, 1973

Size class (acres)	Individual ^a		Corporation		Other ^b		Total	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
OWNERS								
1- 9	55,900	64	—	—	—	—	55,900	64
10- 19	8,200	9	—	—	—	—	8,200	9
20- 49	8,700	10	300	**	300	**	9,300	11
50- 99	6,500	7	200	**	100	**	6,800	8
100-199	4,300	5	300	**	100	**	4,700	5
200-499	1,600	2	200	**	200	**	2,000	2
500+	400	1	100	**	100	**	600	1
Total	85,600	98	1,100	1	800	1	87,500	100
ACRES OWNED								
1- 9	159,100	4	—	—	—	—	159,100	4
10- 19	103,400	2	—	—	—	—	103,400	2
20- 49	254,600	6	8,000	**	8,000	**	270,600	7
50- 99	453,600	11	8,000	**	8,000	**	469,600	11
100-199	557,000	14	31,800	1	15,900	**	604,700	15
200-499	477,500	12	63,700	2	55,600	1	596,800	15
500+	453,600	11	1,129,900	28	294,400	7	1,877,900	46
Total	2,458,800	60	1,241,400	31	381,900	9	4,082,100	100

** Less than 0.5 percent.

^a Includes joint ownerships.

^b Includes partnerships, undivided estates, clubs, associations, etc.

Table 2.—Estimated number of private owners of commercial forest land and the acreage they own, by size-class and form of ownership in Vermont, 1973

Size class (acres)	Individual ^a		Corporation		Other ^b		Total	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
OWNERS								
1- 9	33,500	43	—	—	—	—	33,500	43
10- 19	8,600	11	—	—	1,100	1	9,700	12
20- 49	13,800	18	300	1	700	1	14,800	20
50- 99	7,700	10	—	—	100	**	7,800	10
100-199	6,200	8	200	**	400	1	6,800	9
200-499	3,500	5	100	**	300	**	3,900	5
500+	600	1	100	**	100	**	800	1
Total	73,900	96	700	1	2,700	3	77,300	100
ACRES OWNED								
1- 9	57,900	1	—	—	—	—	57,900	1
10- 19	96,500	2	—	—	9,700	**	106,200	3
20- 49	357,200	9	9,700	**	19,300	**	386,200	10
50- 99	444,200	11	—	—	9,700	**	453,900	11
100-199	695,300	18	19,300	**	57,900	1	772,500	19
200-499	859,400	22	38,600	1	48,300	1	946,300	24
500+	425,100	11	791,900	20	48,300	1	1,265,300	32
Total	2,935,600	74	859,500	22	193,200	4	3,988,300	100

**Less than 0.5 percent.

^a Includes joint ownerships.

^b Includes partnerships, undivided estates, clubs, associations, etc.

Table 3.—Estimated number of private owners of commercial forest land and the acreage they own, by ownership category and state, New Hampshire and Vermont, 1973

Ownership category	New Hampshire		Vermont		Total	
	Number	Percent	Number	Percent	Number	Percent
OWNERS						
Non-corporate ^a	86,100	98	76,100	98	162,200	98
Forest industry	*	**	100	**	100	**
Non-forest industry	300	**	*	**	300	**
Non-industrial business	100	**	100	**	200	**
Corporate farms	*	**	*	**	*	**
Development real estate	600	1	500	1	1,100	1
Other ^b	400	1	500	1	900	1
Total	87,500	100	77,300	100	164,800	100
ACRES OWNED						
Non-corporate ^a	2,832,800	70	3,080,600	77	5,903,700	73
Forest industry	946,900	23	666,300	17	1,613,200	20
Non-forest industry	55,700	1	48,300	1	104,000	1
Non-industrial business	15,900	1	9,600	**	25,500	**
Corporate farms	8,000	**	19,300	1	27,300	1
Development real estate	127,300	3	115,800	3	252,800	3
Other ^b	95,500	2	48,400	1	143,900	2
Total	4,082,100	100	3,988,300	100	8,070,400	100

* Fewer than 50 owners.

** Less than 0.5 percent.

^a Includes individuals, joint ownerships, and partnerships.

^b Includes clubs, youth organizations, churches, and educational institutions.

Table 4.—Estimated number of individual owners of commercial forest land and the acreage they own, by occupation and state, New Hampshire and Vermont, 1973

Occupation	New Hampshire		Vermont		Total	
	Number	Percent	Number	Percent	Number	Percent
OWNERS						
Professional	14,900	18	8,500	12	23,400	15
Executive	5,300	6	17,300	23	22,600	14
Retired	13,800	16	9,000	12	22,800	14
White collar	22,400	26	4,300	6	26,700	17
Skilled laborer	23,300	27	21,100	28	44,400	28
Unskilled laborer	1,700	2	1,900	3	3,600	2
Housewife	2,000	3	3,700	5	5,700	4
Farmer	1,100	1	7,600	10	8,700	5
Other	1,100	1	500	1	1,600	1
Total	85,600	100	73,900	100	159,500	100
ACRES OWNED						
Professional	519,000	21	648,800	22	1,167,800	22
Executive	465,400	19	465,000	16	930,400	17
Retired	508,500	21	605,600	21	1,114,100	21
White collar	289,800	12	259,500	9	549,300	10
Skilled laborer	306,600	12	151,400	5	458,000	8
Unskilled laborer	79,800	3	64,900	2	144,700	3
Housewife	96,600	4	97,300	3	193,900	4
Farmer	175,600	7	589,000	20	764,600	14
Other	17,500	1	54,100	2	71,600	1
Total	2,458,800	100	2,935,600	100	5,394,400	100

Table 5.—Age class of individual owners, by number of owners and acreage of commercial forest land owned, New Hampshire and Vermont, 1973

Age class (years)	Owners		Commercial forest land owned	
	Number	Percent	Acres	Percent
OWNERS WHO HARVESTED				
Under 45	4,500	13	503,700	17
45-64	17,100	49	1,553,600	54
65 plus	13,300	38	845,800	29
Total	34,900	100	2,903,100	100
OWNERS WHO HAVE NOT HARVESTED				
Under 45	78,100	63	832,100	33
45-64	30,600	24	1,245,400	50
65 plus	15,900	13	413,800	17
Total	124,600	100	2,491,300	100
ALL OWNERS				
Under 45	82,600	52	1,335,800	25
45-64	47,700	30	2,799,000	52
65 plus	29,200	18	1,259,600	23
Total	159,500	100	5,394,400	100

Table 6.—Years of completed formal education for individual owners, by number of owners and acres of commercial forest land owned, New Hampshire and Vermont, 1973

Education level	Owners		Commercial forest land owned	
	<i>Number</i>	<i>Percent</i>	<i>Acres</i>	<i>Percent</i>
0-8 years	17,200	11	666,200	12
9-12 years	46,400	29	1,353,700	25
Beyond high school	60,600	38	1,021,600	19
Bachelor's degree	12,900	8	950,800	18
Graduate school	3,200	2	354,400	7
Master's degree	11,300	7	613,200	11
Doctor's degree	7,900	5	434,500	8
Total	159,500	100	5,394,400	100

Table 7.—Individual owners by income groups, number of owners, and acres of commercial forest land owned, New Hampshire and Vermont, 1973

Annual income	Owners		Commercial forest land owned	
	<i>Number</i>	<i>Percent</i>	<i>Acres</i>	<i>Percent</i>
OWNERS WHO HARVESTED				
Under \$3,000	3,400	10	313,000	11
\$ 3,000 - 10,000	14,600	42	615,600	21
\$10,000 - 15,000	8,000	23	520,800	18
\$15,000 - 30,000	4,600	13	622,100	21
\$30,000 plus	4,300	12	831,600	29
Total	34,900	100	2,903,100	100
OWNERS WHO HAVE NOT HARVESTED				
Under \$3,000	9,700	8	176,100	7
\$ 3,000 - 10,000	44,300	35	416,400	17
\$10,000 - 15,000	26,400	21	562,200	22
\$15,000 - 30,000	29,300	24	573,500	23
\$30,000 plus	14,900	12	763,100	31
Total	124,600	100	2,491,300	100
ALL OWNERS				
Under \$3,000	13,100	8	489,100	9
\$ 3,000 - 10,000	58,900	37	1,032,000	19
\$10,000 - 15,000	34,400	22	1,083,000	20
\$15,000 - 30,000	33,900	21	1,195,600	22
\$30,000 plus	19,200	12	1,594,700	30
Total	159,500	100	5,394,400	100

Table 8.—Early life environment of individual owners, by number of owners and acreage of commercial forest land owned, New Hampshire and Vermont, 1973

Type of environment ^a	Owners		Commercial forest land owned	
	<i>Number</i>	<i>Percent</i>	<i>Acres</i>	<i>Percent</i>
OWNERS WHO HARVESTED				
City over 15,000	8,000	24	798,700	28
Town under 15,000	8,300	24	443,900	15
Rural area	18,600	52	1,660,500	57
Total	34,900	100	2,903,100	100
OWNERS WHO HAVE NOT HARVESTED				
City over 15,000	46,000	37	1,079,700	43
Town under 15,000	35,700	29	496,800	20
Rural area	42,900	34	914,800	37
Total	124,600	100	2,491,300	100
ALL OWNERS				
City over 15,000	54,000	34	1,878,400	35
Town under 15,000	44,000	28	940,700	17
Rural area	61,500	38	2,575,300	48
Total	159,500	100	5,394,400	100

^a. First 12 years of life.

Table 9.—Period of ownership of commercial forest land, by number of owners and acres owned, New Hampshire and Vermont, 1973

Period of ownership (years)	Owners		Commercial forest land owned	
	<i>Number</i>	<i>Percent</i>	<i>Acres</i>	<i>Percent</i>
OWNERS WHO HARVESTED				
Less than 5	3,000	8	365,800	7
5- 9	5,700	14	464,000	9
10-24	16,300	42	1,439,100	27
25-49	11,300	29	1,986,000	38
More than 50	2,800	7	1,031,300	19
Total	39,100	100	5,286,200	100
OWNERS WHO HAVE NOT HARVESTED				
Less than 5	58,500	46	691,700	25
5- 9	20,800	17	650,800	23
10-24	33,900	27	1,008,700	36
25-49	11,400	9	330,300	12
More than 50	1,100	1	102,700	4
Total	125,700	100	2,784,200	100
ALL OWNERS				
Less than 5	61,500	37	1,057,500	13
5- 9	26,500	16	1,114,800	14
10-24	50,200	31	2,447,800	30
25-49	22,700	14	2,316,300	29
More than 50	3,900	2	1,134,000	14
Total	164,800	100	8,070,400	100

Table 10.—Distance owner's residence is from his nearest tract, by number of owners and acreage of commercial forest land owned, New Hampshire and Vermont, 1973

Distance from tract	Owners		Commercial forest land owned	
	<i>Number</i>	<i>Percent</i>	<i>Acres</i>	<i>Percent</i>
Residence to 5 miles	136,400	83	6,398,000	79
6- 15 miles	6,900	4	480,100	6
16- 25 miles	800	1	95,200	1
26- 50 miles	1,900	1	136,400	2
51-100 miles	6,500	4	201,900	3
100 miles plus	12,300	7	758,800	9
Total	164,800	100	8,070,400	100

Table 11.—Number of tracts of commercial forest land owned, by number of owners and total acreage they own, New Hampshire and Vermont, 1973

Number of tracts	Owners		Commercial forest land owned	
	<i>Number</i>	<i>Percent</i>	<i>Acres</i>	<i>Percent</i>
OWNERS WHO HARVESTED				
1	26,800	69	2,084,900	39
2	6,000	15	599,400	11
3	2,300	6	347,700	8
4	1,600	4	276,100	5
5	1,400	3	176,000	3
6 plus	1,000	3	1,802,100	34
Total	39,100	100	5,286,200	100
OWNERS WHO HAVE NOT HARVESTED				
1	114,100	91	1,704,400	61
2	8,800	7	563,100	20
3	1,400	1	192,300	7
4	600	1	72,100	3
5	200	**	33,600	1
6 plus	600	**	218,700	8
Total	125,700	100	2,784,200	100
ALL OWNERS				
1	140,900	85	3,789,300	47
2	14,800	10	1,162,500	14
3	3,700	2	540,000	7
4	2,200	1	348,200	4
5	1,600	1	209,600	3
6 plus	1,600	1	2,020,800	25
Total	164,800	100	8,070,400	100

**Less than 0.5 percent.

Table 12.—Reason for owning commercial forest, by number of owners, acres owned, and by state, New Hampshire and Vermont, 1973^a

Reason	New Hampshire		Vermont		Total	
	Number	Percent	Number	Percent	Number	Percent
OWNERS						
Land investment	5,900	7	10,000	13	15,900	10
Recreation	16,700	20	17,900	23	34,600	21
Timber production	3,800	4	5,400	7	9,200	6
General farm use	7,200	8	6,600	9	13,800	8
Place of residence	48,300	55	25,900	33	74,200	45
Other	5,600	6	11,500	15	17,100	10
Total	87,500	100	77,300	100	164,800	100
ACRES OWNED						
Land investment	778,200	19	548,600	14	1,326,800	17
Recreation	880,500	22	873,900	22	1,754,400	22
Timber production	933,900	23	760,700	19	1,694,600	21
General farm use	278,200	7	479,900	12	758,100	9
Place of residence	719,500	17	824,400	21	1,543,900	19
Other	491,800	12	500,800	12	992,600	12
Total	4,082,100	100	3,988,300	100	8,070,400	100

^a Based on a pooling of the first four reasons given.

Table 13.—Reason for owning commercial forest land, by number of owners who have harvested timber and by the number of acres they own, by state, New Hampshire and Vermont, 1973^a

Reason	New Hampshire		Vermont		Total	
	Number	Percent	Number	Percent	Number	Percent
OWNERS						
Land investment	2,500	3	2,400	3	4,900	3
Recreation	2,400	3	3,200	4	5,600	3
Timber production	1,900	2	4,300	6	6,200	4
General farm use	1,900	2	3,800	5	5,700	3
Place of residence	7,000	8	6,900	9	13,900	9
Other	400	**	2,400	3	2,800	2
Total	16,100	18	23,000	30	39,100	24
ACRES OWNED						
Land investment	507,300	12	336,700	9	844,000	11
Recreation	540,700	14	480,400	12	1,021,100	13
Timber production	787,700	19	644,700	16	1,432,400	18
General farm use	153,500	4	328,500	8	482,000	6
Place of residence	293,700	7	476,300	12	770,000	9
Other	367,100	9	369,600	9	736,700	9
Total	2,650,000	65	2,636,200	66	5,286,200	66

** Less than 0.5 percent.

^a See footnote, table 12.

Table 14.—Reason for owning commercial forest land, by number of owners who have not harvested timber and by the number of acres they own, by state, New Hampshire and Vermont, 1973 ^a

Reason	New Hampshire		Vermont		Total	
	<i>Number</i>	<i>Percent</i>	<i>Number</i>	<i>Percent</i>	<i>Number</i>	<i>Percent</i>
OWNERS						
Land investment	3,400	4	7,600	10	11,000	7
Recreation	14,300	17	14,700	19	29,000	18
Timber production	1,900	2	1,100	1	3,000	2
General farm use	5,300	6	2,800	3	8,100	5
Place of residence	41,300	47	19,000	25	60,300	36
Other	5,200	6	9,100	12	14,300	8
Total	71,400	82	54,300	70	125,700	76
ACRES OWNED						
Land investment	270,900	7	211,900	5	482,800	6
Recreation	339,800	8	393,500	10	733,300	9
Timber production	146,200	4	116,000	3	262,200	3
General farm use	124,700	3	151,400	4	276,100	3
Place of residence	425,800	10	348,100	9	773,900	10
Other	124,700	3	131,200	3	255,900	3
Total	1,432,100	35	1,352,100	34	2,784,200	34

^a See footnote, table 12.

Table 15.—Benefits derived from the ownership of commercial forest land in the last 5 years and benefits expected in the next 5 years, by numbers of owners who have and number who have not harvested timber and by the number of acres they own, New Hampshire and Vermont, 1973

Benefits	Last 5 years				Next 5 years			
	Owners		Commercial forest land owned		Owners		Commercial forest land owned	
	Number	Percent	Acres	Percent	Number	Percent	Acres	Percent
OWNERS WHO HARVESTED								
Recreation	5,300	3	979,300	12	1,000	1	270,500	3
Sale of timber	5,300	3	1,216,100	15	2,200	1	710,300	9
Land value increase	10,600	7	1,103,800	14	12,900	8	1,241,500	16
Esthetics	11,500	7	923,000	11	14,700	9	996,700	12
Farm and domestic use	5,300	3	468,800	6	6,800	4	547,200	7
Other	1,100	1	595,200	8	1,500	1	1,520,000	19
Total	39,100	24	5,286,200	66	39,100	24	5,286,200	66
OWNERS WHO HAVE NOT HARVESTED								
Recreation	26,200	16	704,700	9	15,900	9	337,800	4
Sale of timber	—	—	—	—	800	1	92,900	1
Land value increase	23,000	14	624,300	8	29,400	18	685,800	8
Esthetics	47,800	29	1,038,500	13	68,700	41	1,337,800	17
Farm and domestic use	16,400	10	300,800	3	7,500	5	225,200	3
Other	12,300	7	115,900	1	3,400	2	104,700	1
Total	125,700	76	2,784,200	34	125,700	76	2,784,200	34
ALL OWNERS								
Recreation	31,500	19	1,684,000	21	16,900	10	608,300	7
Sale of timber	5,300	3	1,216,100	15	3,000	2	803,200	10
Land value increase	33,600	21	1,728,100	22	42,300	26	1,927,300	24
Esthetics	59,300	36	1,961,500	24	83,400	50	2,334,500	29
Farm and domestic use	21,700	13	769,600	9	14,300	9	772,400	10
Other	13,400	8	711,100	9	4,900	3	1,624,700	20
Total	164,800	100	8,070,400	100	164,800	100	8,070,400	100

Table 16.—Reason for harvesting timber, by ownership groups, number of owners, and acres owned, New Hampshire and Vermont, 1973

Reason	Individuals ^a		Corporations		Other ^b		Total	
	<i>Number</i>	<i>Percent</i>	<i>Number</i>	<i>Percent</i>	<i>Number</i>	<i>Percent</i>	<i>Number</i>	<i>Percent</i>
OWNERS								
Timber mature	7,600	19	400	1	1,800	5	9,800	25
Land clearing	6,200	16	500	1	100	**	6,800	17
Need of money	10,300	26	400	1	200	1	10,900	28
Company use	5,700	15	100	**	100	**	5,900	15
Recommended	1,500	4	*	**	—	—	1,500	4
Good price	2,800	8	*	**	100	**	2,900	8
Other ^c	800	2	*	**	500	1	1,300	3
Total	34,900	90	1,400	3	2,800	7	39,100	100
ACRES OWNED								
Timber mature	1,230,600	23	290,900	6	328,200	6	1,849,700	35
Land clearing	127,500	2	23,900	1	17,700	**	169,100	3
Need of money	740,700	14	114,200	2	29,000	1	883,900	17
Company use	411,900	8	72,100	1	39,700	1	523,700	10
Recommended	52,800	1	15,900	**	—	—	68,700	1
Good price	211,500	4	8,000	**	19,300	**	238,800	4
Other ^c	128,100	3	1,396,900	26	27,300	1	1,552,300	30
Total	2,903,100	55	1,921,900	36	461,200	9	5,286,200	100

* Fewer than 50 owners.

** Less than 0.5 percent.

^a Includes joint ownerships.

^b Includes partnerships, undivided estates, clubs, associations, etc.

^c Includes salvage and cultural operations.

Table 17.—Reason for not harvesting, by ownership group, number of owners, and acres owned, New Hampshire and Vermont, 1973

Reason	Individuals ^a		Corporations		Other ^b		Total	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
OWNERS								
Timber immature	28,100	22	*	**	100	**	28,200	23
Timber of poor quality	5,600	4	—	—	—	—	5,600	4
Low volume	9,200	7	100	**	—	—	9,300	7
Insufficient area	26,000	21	—	—	—	—	26,000	21
Low price	1,200	1	100	**	—	—	1,300	1
Would ruin scenery	37,800	30	100	**	100	**	38,000	30
Opposed to harvesting	600	1	—	—	—	—	600	1
Would destroy hunting	1,400	1	—	—	—	—	1,400	1
Planning to sell	700	1	**	**	100	**	800	1
Distrust loggers	1,500	1	—	—	—	—	1,500	1
Other	12,500	10	100	**	400	**	13,000	10
Total	124,600	99	400	**	700	1	125,700	100
ACRES OWNED								
Timber immature	719,300	26	27,300	1	27,300	1	773,900	28
Timber of poor quality	93,100	3	—	—	—	—	93,100	3
Low volume	190,400	7	24,000	1	—	—	214,400	8
Insufficient area	79,800	3	—	—	—	—	79,800	3
Low price	78,500	3	8,000	**	—	—	86,500	3
Would ruin scenery	536,500	19	25,600	1	17,600	1	579,700	21
Opposed to harvesting	74,700	3	—	—	—	—	74,700	3
Would destroy hunting	83,000	3	—	—	—	—	83,000	3
Planning to sell	63,600	2	49,400	2	31,800	1	144,800	5
Distrust loggers	84,800	3	—	—	—	—	84,800	3
Other	487,600	18	44,700	1	37,200	1	569,500	20
Total	2,491,300	90	179,000	6	113,900	4	2,784,200	100

* Fewer than 50 owners.

** Less than 0.5 percent.

^a Includes joint ownerships.

^b Includes partnerships, undivided estates, clubs, associations, etc.

Table 18.—Forest products harvested, by number of owners and acres owned, by state, New Hampshire and Vermont, 1973

Product harvested	New Hampshire		Vermont		Total	
	Number	Percent	Number	Percent	Number	Percent
OWNERS						
Sawlogs only	10,900	68	6,500	28	17,400	44
Pulpwood only	600	4	1,000	4	1,600	4
One other product	1,300	8	3,200	14	4,500	12
Sawlogs and pulpwood	1,400	8	2,900	13	4,300	11
Other two-product combination	800	5	5,800	25	6,600	17
Three products	600	4	1,800	8	2,400	6
Four products	200	1	100	1	300	1
Five or more products	*	**	*	**	*	**
Don't know	300	2	1,700	7	2,000	5
Total	16,100	100	23,000	100	39,100	100
ACRES OWNED						
Sawlogs only	827,100	31	747,600	29	1,574,700	30
Pulpwood only	88,300	3	39,300	1	127,600	2
One other product	56,200	2	98,400	4	154,600	3
Sawlogs and pulpwood	104,400	4	324,600	12	429,000	8
Other two-product combination	200,800	8	550,800	21	751,600	14
Three products	385,400	15	245,900	9	631,300	12
Four products	224,800	8	68,900	3	293,700	6
Five or more products	722,800	27	521,400	20	1,244,200	24
Don't know	40,200	2	39,300	1	79,500	1
Total	2,650,000	100	2,636,200	100	5,286,200	100

* Fewer than 50 owners.

** Less than 0.5 percent.

Table 19.—Method of selecting timber to be harvested, by individual who selected the timber, by number of owners, and acres owned, New Hampshire and Vermont, 1973

Who selected	Selection	Diameter limit	Clearcut	Land clearing	Other ^a	Don't know	Total	Percent
OWNERS								
Landowner	1,800	4,300	3,800	6,500	2,100	500	19,000	49
Forester	5,300	200	*	—	*	—	5,500	14
Buyer	500	3,700	1,300	100	1,700	1,900	9,200	24
Landowner and forester	500	300	100	—	300	—	1,200	3
Landowner and buyer	700	2,100	100	200	100	100	3,300	8
Other	300	400	—	—	200	—	900	2
Total	9,100	11,000	5,300	6,800	4,400	2,500	39,100	100
ACRES OWNED								
Landowner	237,200	462,400	113,800	117,400	233,100	55,800	1,219,700	23
Forester	1,174,000	544,000	39,900	—	103,300	—	1,861,200	35
Buyer	79,700	299,300	75,800	8,000	107,600	53,900	624,300	12
Landowner and forester	109,700	86,500	10,000	—	39,800	—	246,000	5
Landowner and buyer	59,900	236,700	38,000	10,000	15,900	9,900	370,400	7
Other	61,800	179,300	—	—	723,500	—	964,600	18
Total	1,722,300	1,808,200	277,500	135,400	1,223,200	119,600	5,286,200	100

* Fewer than 50 owners.

^a Combination of methods.

Table 20.—Method of selecting timber to be harvested, by product harvested, number of owners, and acres owned, New Hampshire and Vermont, 1973

Products harvested	Selection	Diameter limit	Clearcut	Land clearing	Other ^a	Don't know	Total	Percent
OWNERS								
Sawlogs only	4,000	5,000	1,500	4,500	2,100	300	17,400	44
Pulpwood	900	600	—	—	100	—	1,600	4
One other product	200	—	2,400	400	1,200	300	4,500	12
Sawlogs and pulpwood	800	2,000	1,200	200	100	—	4,300	11
Other two-product combination	2,000	1,900	100	1,500	600	500	6,600	17
Three or more products	600	1,500	*	200	200	200	2,700	7
Don't know	600	—	100	—	100	1,200	2,000	5
Total	9,100	11,000	5,300	6,800	4,400	2,500	39,100	100
ACRES OWNED								
Sawlogs only	698,900	501,800	109,900	69,500	167,000	27,600	1,574,700	30
Pulpwood only	25,700	85,200	—	—	16,700	—	127,600	2
One other product	24,000	—	9,800	8,100	85,400	27,300	154,600	3
Sawlogs and pulpwood	145,000	130,300	92,000	17,900	43,800	—	429,000	8
Other two-product combination	294,000	272,700	9,800	31,800	124,000	19,300	751,600	14
Three or more products	506,900	818,200	47,900	8,100	778,300	9,800	2,169,200	41
Don't know	27,800	—	8,100	—	8,000	35,600	79,500	2
Total	1,722,300	1,808,200	277,500	135,400	1,223,200	119,600	5,286,200	100

* Fewer than 50 owners.

^a Combination of methods

Table 21.—Expected time of future timber harvest, by number of owners and acres owned, by state, New Hampshire and Vermont, 1973

Expected time of future harvest	New Hampshire		Vermont		Total	
	Number	Percent	Number	Percent	Number	Percent
OWNERS						
0- 5 years	4,900	6	6,500	8	11,400	7
6-10 years	1,300	1	4,300	6	5,600	3
Indefinite	22,400	26	24,000	31	46,400	28
Never intends to cut	58,900	67	42,500	55	101,400	62
Total	87,500	100	77,300	100	164,800	100
ACRES OWNED						
0- 5 years	1,963,300	48	1,693,500	43	3,656,800	45
6-10 years	261,800	7	330,700	8	592,500	8
Indefinite	1,276,200	31	1,493,100	37	2,769,300	34
Never intends to cut	580,800	14	471,000	12	1,051,800	13
Total	4,082,100	100	3,988,300	100	8,070,400	100

Table 22.—Agency that owners would contact for forestry assistance, by number of owners and acres owned, by state, New Hampshire and Vermont, 1973

Agency	New Hampshire		Vermont		Total	
	Number	Percent	Number	Percent	Number	Percent
OWNERS						
County	22,300	25	24,800	32	47,100	29
State	2,600	3	1,900	3	4,500	3
Soil Conservation Service	2,100	3	300	**	2,400	1
Forest Service	1,600	2	3,100	4	4,700	3
Consulting and industrial forester	3,500	4	1,400	2	4,900	3
Cooperative Extension Service	16,000	18	1,200	2	17,200	10
Other	100	**	300	**	400	**
Don't know	39,300	45	44,300	57	83,600	51
Total	87,500	100	77,300	100	164,800	100
ACRES OWNED						
County	1,000,900	24	1,835,800	46	2,836,700	35
State	235,500	6	426,200	11	661,700	8
Soil Conservation Service	98,100	2	43,700	1	141,800	2
Forest Service	137,400	3	76,500	2	213,900	3
Consulting and industrial forester	1,501,400	37	721,200	18	2,222,600	28
Cooperative Extension Service	157,000	4	120,200	3	277,200	3
Other	19,600	1	10,700	**	30,300	**
Don't know	932,200	23	754,000	19	1,686,200	21
Total	4,082,100	100	3,988,300	100	8,070,400	100

** Less than 0.5 percent.

Table 23.—Owners who have received forestry assistance, by nature of assistance, number of owners, and acres owned, by state, New Hampshire and Vermont, 1973

Nature of service received	New Hampshire		Vermont		Total	
	Number	Percent	Number	Percent	Number	Percent
OWNERS						
Timber-marking	2,300	3	3,500	5	5,800	4
Timber-stand improvement	3,200	4	2,300	2	5,500	3
Tree-planting	700	1	3,700	5	4,400	3
Timber-sales administration	8,300	9	300	**	8,600	5
Insect and disease control	400	**	600	1	1,000	1
Timber-stand evaluation	1,500	2	800	1	2,300	1
Surveying	200	**	100	**	300	**
General forest management	2,000	2	3,000	4	5,000	3
Other	300	**	800	1	1,100	1
Total^a	16,500	19	13,800	18	30,300	18
ACRES OWNED						
Timber-marking	374,000	9	550,500	14	924,500	11
Timber-stand improvement	485,400	12	270,400	7	755,800	9
Tree-planting	87,500	2	202,800	5	290,300	4
Timber-sales administration	87,500	2	48,300	1	135,800	2
Insect and disease control	31,800	1	19,300	**	51,100	1
Timber-stand evaluation	127,300	3	144,900	4	272,200	3
Surveying	47,700	1	19,300	**	67,000	1
General forest management	1,289,100	32	985,000	25	2,274,100	28
Other	47,700	1	115,900	3	163,600	2
Total^a	2,172,400	53	2,047,300	51	4,219,700	53

** Less than 0.5 percent.

^a Columns are not additive because many owners received more than one type of service.

Table 24.—Recreational uses permitted, by type of use, number of owners, and acres owned, by state, New Hampshire and Vermont, 1973

Use	New Hampshire		Vermont		Total	
	<i>Number</i>	<i>Percent</i>	<i>Number</i>	<i>Percent</i>	<i>Number</i>	<i>Percent</i>
OWNERS						
Hiking	41,600	48	43,100	56	84,700	51
Picnicking	26,400	30	33,300	43	59,700	36
Camping	22,900	26	16,400	21	39,300	24
Fishing	29,500	34	31,900	41	61,400	37
Hunting	39,300	45	45,100	58	84,400	51
Snowmobiling	34,400	39	48,500	63	82,900	50
ACRES OWNED						
Hiking	2,944,200	72	2,954,900	74	5,899,100	73
Picnicking	2,307,600	57	2,298,300	58	4,605,900	57
Camping	1,551,700	38	1,352,000	34	2,903,700	36
Fishing	2,434,900	60	2,327,200	58	4,762,100	59
Hunting	3,007,800	74	3,012,800	76	6,020,600	75
Snowmobiling	2,514,500	62	2,259,600	57	4,774,100	59

Table 25.—Reason for posting land, by number of owners and acres owned, by state, New Hampshire and Vermont, 1973

Reason	New Hampshire		Vermont		Total	
	<i>Number</i>	<i>Percent</i>	<i>Number</i>	<i>Percent</i>	<i>Number</i>	<i>Percent</i>
OWNERS						
Littering	500	2	100	**	600	1
Damage	6,800	27	1,200	5	8,000	16
Safety	1,000	4	2,400	9	3,400	7
Liability	600	3	1,900	8	2,500	5
Access	2,800	11	7,400	29	10,200	20
Hunters	5,300	21	3,100	12	8,400	17
Privacy	6,200	25	9,000	35	15,200	30
Other	1,600	7	400	2	2,000	4
Total	24,800	100	25,500	100	50,300	100
ACRES OWNED						
Littering	81,600	7	15,200	1	96,800	4
Damage	93,500	8	120,400	8	213,900	8
Safety	186,600	16	135,600	9	322,200	12
Liability	46,500	4	165,500	11	212,000	8
Access	163,300	14	421,600	29	584,900	23
Hunters	256,800	23	286,000	20	542,800	21
Privacy	244,900	22	256,000	18	500,900	19
Other	69,800	6	60,200	4	130,000	5
Total	1,143,000	100	1,460,500	100	2,603,500	100

**Less than 0.5 percent.

APPENDIX VI

Metric Equivalents of Units Used in This Report

One acre = 4,068.8 square meters or 0.405 hectares.

Thousand acres = 405 hectares.

Million acres = 405,000 hectares.

One cubic foot = 28,317 cubic centimeters = 0.0283 cubic meters.

Breast height = 1.3716 meters above ground.

One foot = 30.48 centimeters or 0.3048 meters.

One inch = 25.4 millimeters or 2.54 centimeters.

One mile = 1.609 kilometers.

One square foot = 929.03 square centimeters or 0.0929 square meters.

Headquarters of the Northeastern Forest Experiment Station are in Upper Darby, Pa. Field laboratories and research units are maintained at:

- Amherst, Massachusetts, in cooperation with the University of Massachusetts.
- Beltsville, Maryland.
- Berea, Kentucky, in cooperation with Berea College.
- Burlington, Vermont, in cooperation with the University of Vermont.
- Delaware, Ohio.
- Durham, New Hampshire, in cooperation with the University of New Hampshire.
- Hamden, Connecticut, in cooperation with Yale University.
- Kingston, Pennsylvania.
- Morgantown, West Virginia, in cooperation with West Virginia University, Morgantown.
- Orono, Maine, in cooperation with the University of Maine, Orono.
- Parsons, West Virginia.
- Pennington, New Jersey.
- Princeton, West Virginia.
- Syracuse, New York, in cooperation with the State University of New York College of Environmental Sciences and Forestry at Syracuse University, Syracuse.
- Warren, Pennsylvania.

Kingsley, Neal P., and Thomas W. Birch.
1977. **The forest-land owners of New Hampshire and Vermont.**
Northeast. For. Exp. Stn., Upper Darby, Pa.
47 p., illus.
(USDA For. Serv. Resour. Bull. NE-51)

A statistical-analytical report of a mail canvass of the owners of privately owned commercial forest land in New Hampshire and Vermont, based on responses to a mail questionnaire. The study was conducted in conjunction with forest surveys of the two states. Trends in forest-land ownership and the attitudes and intentions of owners regarding reasons for owning forest land, timber management, timber harvesting, and recreational use are discussed.

KEYWORDS: forest-land owners, available timber, harvesting, forestry assistance, recreation

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923:9:(742):(743)

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